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

Host: Professor Armin Aberle (Main Supervisor) (Host)
Assistant Professor Hou Yi (Co-supervisor)

TOPIC	:	**Sputtered NiO_x in Efficient Inverted Perovskite Solar Cells**
SPEAKER	:	**Ms. Lee Ling Kai** **Graduate Student, ECE Dept, NUS**
DATE	:	**Monday, 7 August 2023**
TIME	:	**3.00PM to 4.00PM**
VENUE	:	**Block E3A, E3A-04-25/26** **Level 4 Conference Room A/B** **College of Design and Engineering, NUS**

ABSTRACT

Nickel oxide (NiO_x) is an inorganic material extensively utilized as a Hole Transport Layer (HTL) in inverted structured (p-i-n) perovskite solar cells due to its good band alignment, excellent charge extraction, and cost-effectiveness. Sputtering has emerged as a promising method for upscaling devices due to its superior uniformity. However, inverted perovskite solar cells using sputtered NiO_x-based layers have not yet matched the efficiencies achieved by their solution-processed counterparts. This is primarily because of sub-stoichiometry reactions, leading to increased surface defects and non-radiative recombination losses within the devices. Here, we focused on controlling the sputtered NiO_x growth and conducted a systematic investigation of defects in sputtered NiO_x using X-ray Photoelectron Spectroscopy (XPS). Our efforts resulted in perovskite solar cells with a maximum efficiency of 24% for a device area of 1 cm^2. This research demonstrates the potential of achieving highly efficient and stable perovskite devices, thus holding great promise for the commercialization of perovskite solar cells.

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.