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INSTITUTO DE FÍSICA APLICADA E ENGENHARIA DE MATERIAIS
INSTITUTE OF APPLIED PHYSICS AND MATERIALS ENGINEERING

IAPME Seminar

Defect Engineering of Functional Materials

15 September 2025

Prof. Chi-Chung LING
University of Hong Kong
Venue: N23-1004b
Time: 10:00 - 11:00
Hosted by: Prof. Shuang-Peng WANG

Abstract

Atomic scale intrinsic defects, impurity defects and their complexes play crucial role in determining the materials electrical, optical, magnetic and dielectric properties. Defect engineering includes introducing and removing new defects to (i) introduce new functionality for old materials; (ii) tailoring materials electrical, optical, magnetic and dielectric properties; and (iii) optimizing device performance. Three cases of our recent results will then be introduced, namely: (1) Enhancing the permittivity of oxides by forming new acceptor-donor defect complex acting as electric dipole; (2) Reduction of reverse biased leakage current of SiC junction barrier Schottky diode by 30 times via defect engineering; and (3) Luminescence intensity and saturated magnetization of Cu-doped ZnO modulated via defect level occupancy.

Biography

Prof. Francis Chi-Chung LING obtained his BSc, MPh and PhD at The University of Hong Kong (HKU) respectively in 1990, 1993 and 1996. He then became the Lecturer, Assistant Professor and Tenured Associate Professor at the Department of Physics, HKU respectively in 1998, 2000 and 2006. He was elected as Fellow of the Institute of Physics, U.K. Fellowship of the Institute of Physics (F.Inst.P.) in 2006. He has served as the Associate Dean of the Faculty of Science, HKU from 2016 to 2019; and the Member of the Senate, HKU from 2009-2015. He has published 204 SCI journal papers, having citation over 4500, h-index of 35 and highest single paper citation of 891. His current research focuses include defect characterization, defect control for material functionalization and device performance optimization.

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