Department of Electrical and Computer Engineering

TEXAS TECH UNIVERSITY
Edward E. Whitacre Jr.
College *of* Engineering

Fall 2025 Seminar Series

Seminar Title: ***In-operando microscopy and spectroscopy measurements on 2D materials and devices***

Time: 3:00-3:50 PM, Monday, Oct 13, 2025
Location: ECE 101

Speaker:
Yong P. Chen
Aarhus University, Denmark

Abstract:
Two-dimensional materials offer unique opportunities to perform multimodal, "in-operando", (nano)device-compatible measurements combining various surface science/optical microscopies and spectroscopies with electrical transport/gating, to gain a microscopic and deeper understanding of materials properties and device performance. This talk will describe several examples of such measurements in various gated 2D materials (including twisted/stacked heterostructures) ranging from graphene, 2D magnets and semiconductor transition metal dichalcogenides (TMDCs), studied by optical spectroscopy, angle resolved photoemission spectroscopy (ARPES), and scanning probe microscopies (SPM). In turn, multimodal measurements on 2D materials-based transistor devices help bring out a wide range of potential functionalities beyond electronic applications, ranging from photonics, spintronics, sensing and energy conversion.

Speaker Bio:
Prof. Yong P. Chen received a BSc degree in mathematics from Xi'an Jiaotong University and an MS degree in mathematics from MIT. He received his PhD in Electrical Engineering from Princeton University working with Nobel laureate Prof. Daniel C. Tsui. He then did a postdoc in physics and nanotechnology at Rice University before joining the faculty of Purdue University, where he became the Karl Lark-Horovitz Professor of Physics and Astronomy and Professor of Electrical & Computer Engineering, served as the Inaugural Director of Purdue Quantum Science and Engineering Institute, and co-founded/directed the first NSF Industry-University-Cooperative-Research-Center (IUCRC) on Quantum Technologies. He is currently a Villum Investigator and Professor of Materials Physics at Aarhus University, Denmark and a principal investigator at Advanced Institute for Materials Research at Tohoku University, Japan, where he has been appointed an International Distinguished Professor. His group has made contributions to a wide range of quantum matters in both solid state and AMO physics, involving graphene, topological insulators, 2D materials, and cold atoms & molecules, and their potential applications. He is a Fellow of American Physical Society (APS) and American Association for the Advancement of Science (AAAS).