Polymer Distinguished Alumni Seminar

March 28, 2025

11:15 am Science 1 - Room 1002

Host: Fotios Papadimitrakopoulos

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Tailor the Structure of Two-dimensional Materials towards semiconductor Application

Abstract: The structure of two-dimensional (2D) materials can be tailored during growth to meet a wide range of application needs. Recently, we have developed several strategies to control their synthesis and modify their atomic structures, thereby tuning their properties for specific applications. In our laboratory, we have synthesized various 2D materials—including graphene, hBN, MoTe□, and MoS□—as well as their heterostructures, using techniques such as seeded growth, edge-epitaxial methods, and backside carbon gettering. Moreover, our latest research investigates the electrochemical applications of single transition metal atoms supported on 2D materials for efficient catalysis. In particular, by applying the grand canonical potential kinetics formulation from quantum mechanics, we have predicted the reaction mechanisms and kinetics as functions of the applied potential, which has allowed us to determine the active centers in graphene-supported nickel single-atom catalysts.

Biography: Prof. Zhengtang Tom Luo is currently a professor at the Hong Kong University of Science and Technology. He is currently a Fellow of the Royal Society of Chemistry (FRSC), and serves as the Associate Editor for *ACS applied Materials & Interfaces*. He has obtained his bachelor degree from South China University of Technology and PhD degree (in Polymer Science) from University of Connecticut, followed by postdoctoral training (Physics) at University of Pennsylvania. His research focus on materials chemistry and physics, with the development of edge-epitaxy and seeded growth concept of chemistry of two-dimensional materials, and electronic and biomaterial product development for chemical industry. In 2010, he has co-founded multiple startup companies, and has attracted millions of investments.

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