Seminar: Salinporn Kittiwatanakul

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Overview of Siam Quantum Square (SQ^2): Experimental Work toward Superconducting Qubit and Strongly Correlated Oxide under Strain Effect.

Biography

Salinporn Kittiwatanakul (Lin) is an assistant professor in the Department of Physics, Faculty of Science, Head of Siam Quantum Square (SQ^2), a quantum technology center at Chulalongkorn University and a rising voice in the experimental quantum materials community. Trained under Prof. Stuart Wolf—who coined the term spintronics—she earned her Ph.D. in Physics from the University of Virginia. Her work focuses on designing and engineering quantum materials—particularly strongly correlated oxide thin films—that can undergo fast and energy-efficient phase transitions. These materials are foundational to next-generation computing, especially as the industry pushes toward low-power quantum and cryogenic logic systems. Her research interests are described in 3 “S”—Strongly correlated oxides, Spintronics, and Superconducting devices.

Abstract

Preparing to move toward Quantum Era, Siam Quantum Square (SQ^2) is Chulalongkorn University's new flagship program dedicated to advancing quantum technology research and cultivating future talent. It convenes an interdisciplinary group of experts and students across physics, mathematics, computer science, materials science, chemistry, and engineering. The program's mission is to explore the fundamental nature of quantum physics and translate those insights into the development of quantum technologies. The second part of the talk will include the experimental work of design and lithography, including thin film fabrication toward superconducting qubit, one of the platforms of quantum computer such as Google, IBM, IQM etc.

In addition to superconducting materials, Team Lin or Kittiwatanakul Lab also focus on thin film fabrications, characterizations, and simulations, studying oxides, magnetic films for electrical, optical, magnetic memory, and spintronics devices. Examples of materials we are interested are vanadium dioxide (VO_2), Cr_2O_3, TiO_2, NbO_2, Nb, MnAl, CoFeB, CoFeAl, etc. The techniques we use to synthesize thin films are Reactive Bias Target Ion Beam Deposition (RBTIBD), sputtering, evaporation, spin-coating sol gel, and nanoparticles from combustion and from rapid thermal annealer (RTA). To study crystallinity, morphology, microstructure, electrical, optical, and magnetic properties, XRD, Raman spectroscopy, AFM, UV-VIS-IR spectroscopy, Physical Property Measurement System (PPMS), and probe station with source meters are used. Last part will explain the role of strains on Metal Semiconductor Transition properties of VO_2 which can be utilized in many applications including low-power electronics, bolometer, smart windows, etc.

Séminaire organisé dans le cadre du programme interdisciplinaire MAT-PULSE (*Materials and Physics @ Ultimate Scale: Nanotech for a sustainable digital world)*