THE CHINESE UNIVERSITY OF HONG KONG

Department of Physics

SEMINAR

More Than Just Elemental Quantification – A Look into What Is Possible with a Modern Spectrometer

by

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Date: May 26, 2026 (Tuesday)
Time: 10:00 a.m. - 12:00 n.n.
Place: Rm G25, Science Centre North Block, CUHK

ALL INTERESTED ARE WELCOME
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Abstract

This presentation will highlight two focused applications of photoelectron spectroscopy that address current challenges in surface and materials analysis.

PART1: Cryogenic X ray Photoelectron Spectroscopy (cryo XPS)

For the stabilisation and characterisation of reactive, mobile, or beam sensitive surfaces. By cooling samples under ultra high vacuum, cryo XPS enables the preservation of volatile species, metastable chemical states, and liquid or semi liquid interfaces that would otherwise be altered during conventional analysis. Examples will be presented demonstrating how cryogenic stabilisation improves chemical state fidelity, suppresses radiation damage, and enables the study of hydrated, polymeric, and energy related sensitive surfaces.

PART2: Organic semiconductor materials

Their analysis using a combined XPS and Ultraviolet Photoelectron Spectroscopy (UPS). XPS is used to identify elemental composition, chemical states, and interfacial chemistry, while UPS provides direct insight into valence electronic structure, work function, and energy level alignment. Together, these techniques offer a powerful methodology for understanding charge transport, interfacial energetics, and device relevant surface chemistry in organic electronics. Case studies will illustrate how photoelectron spectroscopy supports the development and optimisation of organic semiconductors for applications such as OLEDs, photovoltaics, and thin film transistors.