

Applications of X-ray Raman Spectroscopy and Hard X-ray Spectroscopy to Energy Sciences

Tsu-Chien Weng



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4:00

Venue: w563, Physics building, Peking University

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Abstract

An overview of the instrumentation and applications of x-ray spectroscopy to energy materials, both from light element side (x-ray Raman scattering) and from the metal side (hard x-ray emission), will be presented. Case study includes the (de)-lithiation process of cathode/anode materials in lithium battery, valence fluctuation in transuranium elements, ligand identification in metalloproteins, site characterization in electrochemical catalysis. The applications of femtosecond resolution x-ray fluorescence spectroscopy using x-ray free electron laser (XFEL) to track the ultrafast spin dynamics in spin-crossover complexes will be also presented.

About the Speaker

Tsu-Chien Weng is a staff scientist at Center of High Pressure Science & Technology Advanced Research (HPSTAR). He received B.Sc. and M.Sc. in Chemistry from National Taiwan University, and Ph.D. in Chemistry from the University of Michigan at Ann Arbor. Following his post-doctoral trainings (2004-2006), he had worked as a staff scientist at ESRF (2006-2010) and SSRL (2010-2015) before joining HPSTAR in 2015. Tsu-Chien conducts interdisciplinary research on the electronic structure and functionality of the transition metals in chemical and biochemical catalysis using x-ray absorption spectroscopy (XAS) and x-ray emission spectroscopy (XES) related techniques. He is applying spectroscopic techniques for in situ study of energy materials and chemical catalysis in-operando conditions, as well as x-ray instrumentation R&D for Synchrotrons, XFELs for studying ultrafast processes.