

Séminaire SOLEIL

Photoelectron spectroscopy at solid/vapor and liquid/vapor interfaces

Hendrik BLUHM

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Invité par Fausto SIROTTI

Lundi 22 septembre - 14h00 - Grand Amphi SOLEIL

The heterogeneous chemistry of solid/vapor, solid/liquid, and liquid/vapor interfaces governs many processes in catalysis, electrochemistry, and the environment. Examples include the removal of harmful components from automotive exhaust streams, heterogeneous reactions at the electrodes of solid oxide fuel cells, cloud droplet nucleation on atmospheric aerosols particles, as well as the uptake and release of trace gases by the polar snowpack. The prospects for a fundamental understanding of the basic reaction mechanisms at these interfaces on the molecular scale and under realistic operating conditions have greatly improved over the past decades through the development of *in situ* surface science methods, among them ambient pressure photoelectron and near edge X-ray absorption spectroscopy. This talk will discuss the application of these techniques to studies of solid/vapor and liquid/vapor interfaces, in particular the reaction of water vapor with oxide surfaces, the interaction of trace gases with ice surfaces, as well as the segregation of ions at the liquid/vapor interface. **New strategies for measuring liquid/solid interfaces by means of photoelectron spectroscopy are discussed in the talk by Chuck Fadley.**

Photoemission with soft and hard x-rays : some future perspectives

Charles S. FADLEY

Department of Physics, University of California, Materials Sciences Division, Lawrence Berkeley National Laboratory, APTCOM Project, Triangle de Physique

Invité par Jean-Pascal RUEFF

Lundi 22 septembre - 14h30 - Grand Amphi SOLEIL

15 September : In the second, I will consider applications of hard x-ray photoemission to the properties of complex bulk materials, including the possibility of hard x-ray photoelectron diffraction (HXPd) and angle-resolved photoemission (HARPES), the measurement of band-offsets in oxide and semiconductor multilayers, and the detection of delta-layer dopants and quantum-size effects on electronic structure in complex oxides. The use of hard x-ray standing waves and total reflection effects to look at buried interfaces will also be considered.

15 and 22 September : In the second and third, I will consider both soft- and hard- x-ray photoemission, including the emerging interest in soft x-ray and hard x-ray ARPES, to study buried layers and interfaces in transition-metal oxide and magnetic multilayers. Special emphasis will be on the use of standing waves and resonant excitation from multilayer samples to enhance depth contrast in spectroscopy, as well as in standing-wave angle-resolved photoemission (SWARPES) and photoelectron microscopy. Such combined SXPS and HXPS studies, including standing-wave excitation, have for example, permitted directly observing changes in the bonding and the k-resolved electronic structure near a buried SrTiO₃/La_{0.7}Sr_{0.3}MnO₃ interface, the depth profile of magnetization at the Fe/MgO interface, and a two-dimensional electron gas at the SrTiO₃/GdTiO₃ interface. A first observation of plasmon dispersion in ARPES will also be discussed. Finally, I will consider standing-wave ambient pressure photoemission (SWAPPS) as a powerful new method for studying the solid/liquid and solid/gas interface.



Ce séminaire sera suivi d'une pause-café



Formalités d'entrée : accès libre dans l'amphi du Pavillon d'Accueil. Si la manifestation a lieu dans le Grand Amphi SOLEIL du Bâtiment Central, merci de vous munir d'une pièce d'identité (à échanger à l'accueil contre un badge d'accès).

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