

Postdoctoral Researcher at Sorbonne Université: Electrochemistry with Near-ambient-Pressure XPS at SOLEIL synchrotron

Subject field and description of the position:

X-Ray Photoemission Spectroscopy (XPS) is a powerful tool for physicochemical characterization. It allows both basic and chemical analysis, giving information on the electronic structure of surfaces and their reactivity. Until recently, the need for ultrahigh vacuum limited the XPS study of surface reactivity to static systems, where the ex-situ reaction was characterized post-mortem, or for systems evolving little over time. Recent technical developments on photoelectron analyzers overcome the gap pressure leading to the so-called **Near Ambient Pressure XPS (NAPXPS)** and open new opportunities for studies surface reactions in operando.

The NAP-XPS of Sorbonne Université is the unique device in France that allows operando XPS measurement under reaction conditions up to a few mbars. Its position at the **TEMPO beamline** on the **SOLEIL synchrotron** source makes it one the most efficient in the world. The project focus on the development of an advanced **electrochemistry cell for in situ XPS measurements**. This advanced tool will be used to unravel the mechanisms of the electrochemical Oxygen Evolution Reaction (OER) on cobalt-containing polyoxometallates which have shown to be promising **Water Oxidation Catalysts (WOCs)** as an alternative to precious metal oxide catalysts.

Position:

The position is between a consortium of three laboratories of Sorbonne Université* and is localized at SOLEIL synchrotron in a highly international research environment.

This position could start in autumn 2019. This is a one year funding from the labex Michem but we are looking for additional funds to extend it for 2/3 years.

The post-doc will have in charge the design and construction of the in situ cell in close collaboration with the consortium. He or she will participate to the synchrotron campaigns (SOLEIL, BESSY, MAX IV) of the teams and lead his/her own research.

Required Qualifications

- PhD in Physical Chemistry or related area with notions of electrochemistry.
- Experience and knowledge in synchrotron radiation techniques will be appreciated.
- Good communication skills in both written and spoken English

* contacts persons :

Dr. Jean-Jacques Gallet, [jean-jacques.gallet@sorbonne-universite.fr], Laboratoire de Chimie Physiques - Matière et Rayonnement, CNRS UMR 7614, Sorbonne Université – Faculté des Sciences et Ingénierie

Pr. Anna Proust, [anna.proust@sorbonne-universite.fr], Institut Parisien de Chimie Moléculaire, CNRS UMR 8232 Sorbonne Université – Faculté des Sciences et Ingénierie

Pr. Emmanuel Maisonhaute, [emmanuel.maisonhaute@sorbonne-universite.fr], Laboratoire Interfaces et Systèmes Electrochimiques, CNRS UMR 8235, Sorbonne Université – Faculté des Sciences et Ingénierie

In close collaboration with:

Pr Elena Savinova, Institut de Chimie et Procédés pour l'Energie, l'Environnement et la Santé, Université de Strasbourg

Dr Lenart Dudy, Synchrotron SOLEIL, Gif-sur-Yvette