Dr. Philippe HAPIOT

Actual Position: *CNRS Researcher* (Directeur de Recherche CNRS) in *"Institut des Sciences Chimiques de Rennes*", University of Rennes, Rennes, France.

Technical knowledge and know-how: Philippe Hapiot obtained his Ph.D. degree from the University of Paris 7 in 1988 in Electrochemistry under the supervision of Prof. J.-M. Savéant. In 2000, he joined the University of Rennes where he has a current position as "Directeur de Recherche" in the Centre National of Scientific Research (CNRS). His research interests concern the mechanisms and reactivity in molecular and interfacial electrochemistry taking advantage of fast or localized electrochemical techniques, Scanning Electrochemical Microscopy and Theory of electrochemical processes. His current researches focus on the electrochemical reactivity in ionic liquids, surface functionalization on metallic and semi-conductor electrodes considering special effects due to environment and applications. He is author of around 220 research papers (H-Index 52) and was nominated Fellow of the International Society of Electrochemistry (ISE).

Localized Electrochemistry for Functional Surfaces.

Philippe Hapiot

Institut des Sciences Chimiques de Rennes, Université de Rennes, CNRS, Rennes, France

Surfaces functionalization presents growing interests due to the large range of possible applications as for example those in analytical, bio-analytical chemistry or molecular electronic. In relation with these expending fields, the developments of electrochemistry at a local scale (micro- and nano-electrochemistry) appear as versatile and straightforward means for building and analysing functionalized and nanostructured surfaces.

In this lecture, we will discuss how a surface reaction and properties of a functionalized surface on different common substrates (Si, C, Pt, Au,…) could be probed, controlled and optimized through adapted and relatively low cost electrochemical techniques, the Scanning Electrochemical Microscopy (SECM) being particularly well-adapted. When used with specific probes, SECM provides a direct chemical view of the surface properties.

Different illustrative examples will be presented taken from our studies in relation with surface reactions as those implying ROS (reactive oxygen species), « click » chemistry coupling, enhancement of charge tunnelling, applications in electroanalysis.