

LECTURE

prof. Andrzej Lasia

University:

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will deliver a series of lectures titled:

**VISITING
PROFESSOR
PROGRAMME**

Electrochemical Impedance Spectroscopy and its applications

DATE: 2 - 13 September 2019 (excluding 4 September) | from 9.00 till 12.00

VENUE: CNBCh UW, sem. room: 0.37

ABSTRACT:

Electrochemical Impedance Spectroscopy (EIS) have seen tremendous increase in popularity in recent years. Initially applied to the determination of the double-layer capacitance and in ac polarography, they are now applied to the characterization of electrode processes and complex interfaces, batteries and fuel cells, corrosion, coatings and paints, supercapacitors, membranes, semiconductors, etc. EIS studies the system response to the application of a periodic small amplitude ac signal. Analysis of the system response contains information about the interface, its structure and reactions taking place there. EIS became very popular in the research and applied chemistry. However, EIS is a very sensitive technique and it must be used with great care. Besides, it is often very poorly understood. This may be connected with the fact that existing reviews on EIS are very often difficult to understand by non-specialists and, frequently, they do not show the complete mathematical developments of equations connecting the impedance with the physico-chemical parameters. It should be stressed that EIS cannot give all the answers. It is a complementary technique and other methods must also be used to elucidate the interfacial processes.

The purpose of this lecture is to fill this gap by presenting a modern and relatively complete review of the subject of electrochemical impedance spectroscopy, containing mathematical development of the fundamental equations. The lecture includes computer exercises on simulation of impedances, Fourier transform data analysis, determination of impedance parameters, data modeling, and Kramers-Kronig transforms.



Activity at Home University:

I was Professeur titulaire until 2012 and now I am Retired professor. I have scientific collaborations with colleagues in the Department and outside.

Research interests and experience:

Development and characterization of new materials for hydrogen evolution, hydrogen absorption in palladium and its alloys and AB₅ materials, kinetics of hydrogen underpotential deposition on noble metals.



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