

## *Spectroscopy at central facilities: infrared and X-ray spectroscopy*

**Jacinto Sá**

*Ångstrom laboratory, Department of Chemistry, Uppsala University, Sweden  
Institute of Physical Chemistry of the Polish Academy of Sciences, Poland*

### **Abstract**

Spectroscopy plays an important role in materials characterization. Often measurements are carried out in research laboratories, where the project is conducted. However, there are particular experiments that are not feasible in the laboratory and require access to central facilities. Access to such facilities is highly competitive and limited, thus experiment preparation and planning needs to be conducted to a level that we almost know what we will measure. In this short guest-lecture series, I will present the following topics:

- a) basics of light generation at synchrotron and X-ray free electron lasers (XFELs)
- b) time-resolved infrared spectroscopy at synchrotron (concept and application)
- c) basics of high resolution photon-in photon-out X-ray spectroscopy
- d) in situ and time-resolved X-ray spectroscopy at synchrotron and XFELs (concept and application)

The aim is to get the attendees familiarized with such experiments and their requirements, as well as to prepare them for such experiments and data analysis, so the time between planning, execution and results reporting is significantly shortened. Thus, this type of experiments can be used to drive both understanding and development of materials

### **References:**

a) *'High-Resolution XAS/XES: Analyzing Electronic Structures of Catalysts'* Ed. J. Sá, CRC Press (2014) ISBN: 978-1-4665-9298-8.