Insights from X-ray Photoelectron Spectroscopy and X-ray Photoelectron Diffraction in 2D Material Research

The study of two-dimensional (2D) materials has emerged as a forefront in materials science, with applications ranging from electronics to energy storage. Investigating the growth, electronic, and structural properties of these materials is paramount for harnessing their unique characteristics. This presentation delves into the techniques of synchrotron radiation High-Resolution X-ray Photoelectron Spectroscopy (HR-XPS), fast-XPS and X-ray Photoelectron Diffraction (XPD) as invaluable tools for comprehensively studying 2D materials.

Throughout this presentation, we will explore case studies and research examples where HR- and fast- XPS, together with XPD experiments performed at the SuperESCA beamline of Elettra, have been employed to investigate the growth kinetics, the electronic and structural properties of various 2D materials, including graphene and transition metal dichalcogenides grown on top of metal surfaces.