

**Seminarium Studium Doktoranckiego NCBJ**

**Thursday, 4 June, 9:00**

<https://www.gotomeet.me/NCBJmeetings/phd-seminar>

**Speaker:**

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**Title:**

Brief introduction to X-Ray photoelectron spectroscopy (XPS) with some examples.

**Abstract:**

X-ray photoelectron spectroscopy (XPS), also known as Electron Spectroscopy for Chemical Analysis (ESCA), is an analysis technique used to obtain chemical information about the surfaces of solid materials. Typical measurements include chemical composition, oxidation state analysis, identification of species, surface reactions, imaging of patterned surfaces and deposits. In methods of 'classical' X-ray electron spectroscopy, the energy distribution of electrons knocked out of a sample by X-ray radiation is measured. There are several types of electron spectroscopy: XPS, Auger, spectroscopy of secondary electrons, etc. All methods of electron spectroscopy are used to study the surface, since the electron escape depth in the energy range typical of these methods does not exceed 50-100 Å. As is mentioned above, XPS method is fundamental in determining the quantitative chemical composition of a surface. The positions of the lines in the photoelectron spectra correspond to the binding energies of the electronic levels, i.e. provide information on the electronic state of atoms on the surface (chemical shifts of core levels), as well as on the energy/electronic structure of the valence band. The effects that manifest themselves in photoelectron spectra and carry additional information include spin-orbit splitting of lines into multiplets, two-electron processes (low-energy "shake-up" and "shake-off" satellites), inelastic photoelectron losses (characteristic bulk and surface plasmons). Consequently, the objective of presentation is to highlight the capabilities of XPS technique for the determination of the key structural and material parameters.