

Nanoscale Imaging and Spectroscopy with a Photoemission Electron Microscope

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The rapid progress of experimental techniques with access to chemical composition, electronic structure, magnetization, and fluctuations in these properties at nanometer and sub-micron scales has been driven by the demand imposed by the continuous miniaturization and increasing complexity of the materials used in modern technology. Photoemission electron microscopy is among the oldest methods in electron microscopy. In recent years it has seen a strong revival with an increasing role of synchrotron radiation, which has been facilitated by the construction of third generation synchrotron light sources.

In my talk I will first review the present situation and future developments of photoemission electron microscopy in combination with synchrotron radiation. In particular, I will discuss the role of energy filtering, aberration correction, and temporal resolution. Then I will illustrate the potential of photoemission electron microscopy by discussing some selected applications from various fields of nano-material and surface science research.