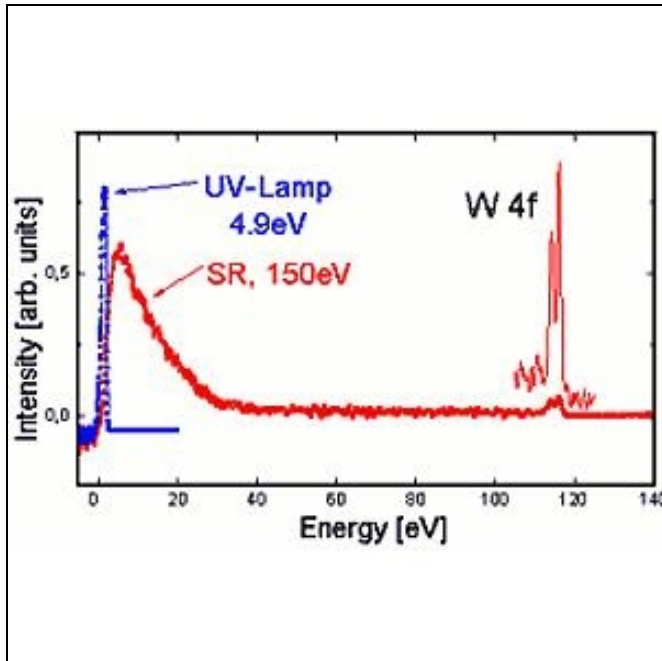
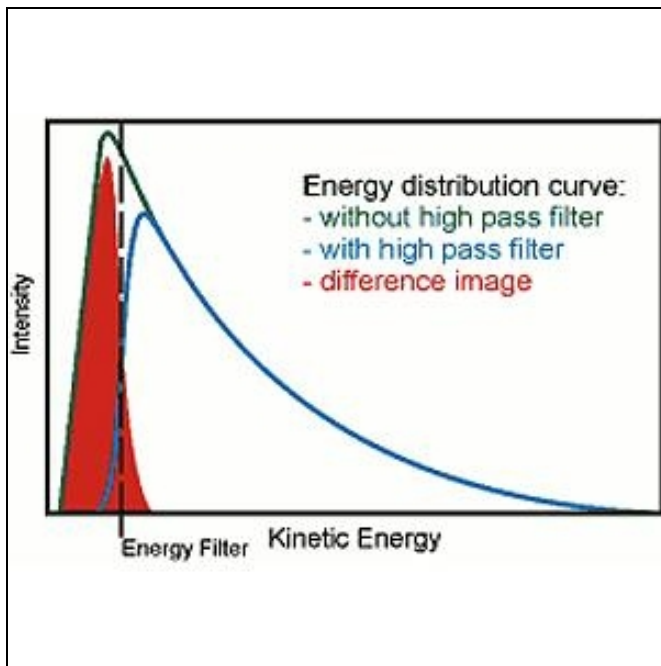


## Imaging High-Pass Energy Filter

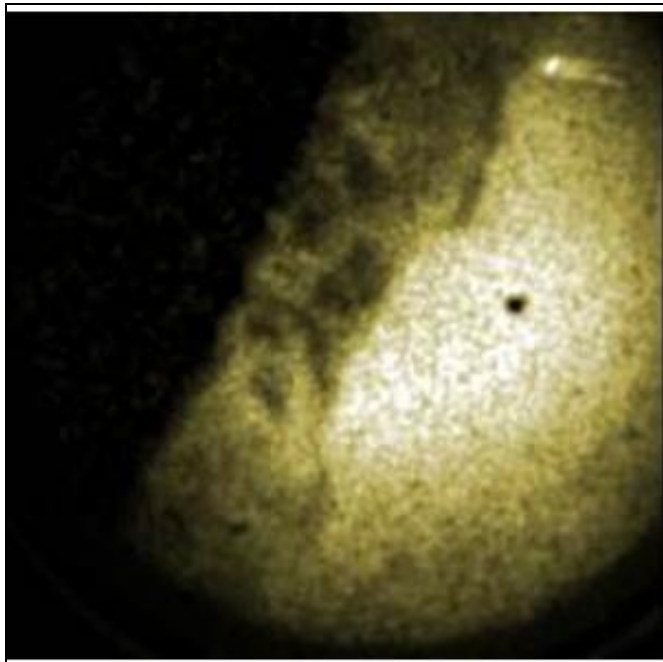


The narrow energy window (red) yields improved contrast and resolution.

Setting the energy filter to a specific electron energy facilitates element specific mapping (using difference images at XPS or AES lines) with increased contrast. The energy filter can also be used for microspectroscopy analysis. XPS and AES spectra up to a kinetic energy of 1500 eV and with energy resolution well below 1 eV can be obtained in areas smaller than 1  $\mu\text{m}$ , as selected by the iris aperture. The incorporation of energy filtering into the FOCUS PEEM or FOCUS IS-PEEM yields improved performance and opens up new application possibilities. XPS and AES spectra up to a kinetic energy of 1500 eV and with energy resolution well below 1 eV can be obtained in areas smaller than 1  $\mu\text{m}$ , as selected by the iris aperture. The incorporation of energy filtering into the FOCUS PEEM or FOCUS IS-PEEM yields improved performance and opens up new application possibilities. The imaging energy filter acts as a high pass filter for the full image. The retarding field energy filter is situated in front of the multichannelplate, and can be easily retrofitted to existing PEEMs. Improved spatial resolution is made possible by the energy filter, which effectively reduces chromatic aberrations, i.e. the energy spread of the electrons contributing to the formation of the image. This is of particular importance for chemical and magnetic imaging in synchrotron applications, where the achievable resolution is reduced due to the "unfocused" contribution of high energy electrons. Using laboratory excitation sources (threshold photoemission microscopy), imaging at specific work functions with energy filtering yields a strongly enhanced contrast.



*Electron energy distribution curves (differentiated) from a tungsten sample measured with the energy filter using a UV lamp and synchrotron radiation (SR) with  $h\nu = 150$  eV; the W 4f levels are clearly resolved.*



*Courtesy of Ch. Ziethen, O. Schmidt, A. Oelsner and G. Schönhense; University of Mainz;*

This result has been obtained with : **OMICRON FOCUS PEEM with Imaging Energy Filter**