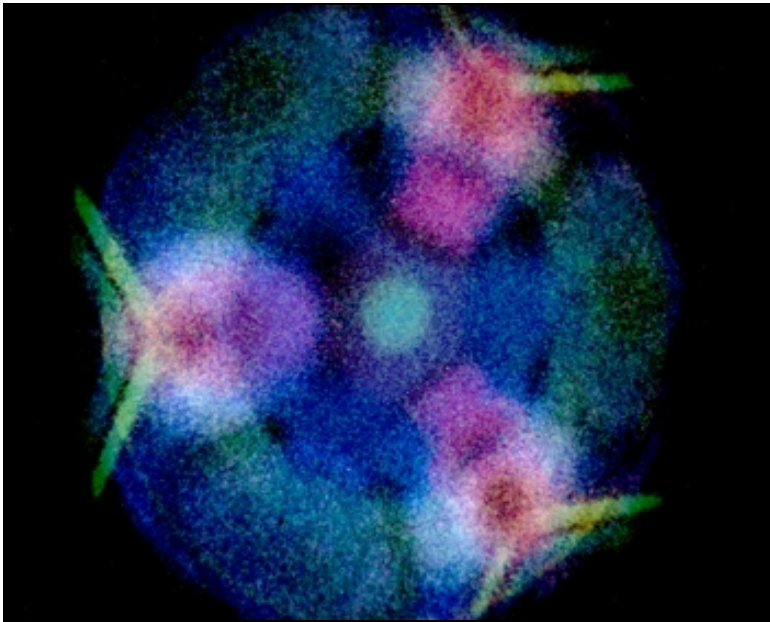


## Colour overlay of angular maps from Cu 3d and sp hybrid peaks (Result of the month 05/2008)

Imaging the complete Fermi surface in a single shot with acquisition time of seconds allows a broad variety of applications. Observing evaporation changing the shape of Fermi surface as well as time dependent heating and cool down observations and chemical processes can easily be carried out.



The video shows the angular integrated spectrum following the currently displayed angular image on the bottom side.

Two cuts through a k-space cube. 60 sec per image.

A k-space data cube, intensity  $I(k_x, k_y, \text{Energy})$ , consisting of 120 complete angular images  $I(k_x, k_y)$  was recorded. Images were taken at binding energies from 0 to  $\sim 5.6$  eV with an energy increment of 50 meV.

A He I VUV lab source (HIS 13) was used to excite the photoelectrons. Acquisition time was 60 sec per image.

### *Bandstructure of Cu*

*(Data Courtesy of: Friedrich Reinert and Stefan Hüfner*

*New Journal of Physics 7 (2005) 97)*

*Cut through k-space data cube along L G X axis*

Angular distributions corresponding to each peak of an angle integrated UPS spectrum can be easily extracted from a 3D data stack  $I(E, k_x, k_y)$  of angular maps recorded at different energies. The Cu(111) angular integrated UPS spectrum is shown in the Fig. among. Cu - 3d and sp - hybrid peaks can be used by PHI MultiPak™ to extract the corresponding

angular images. The data structure is compatible with PHI MultiPak™ a data analysis software package commonly used for UPS and XPS spectrum and image analysis. The software offers a variety of peak fitting and background subtraction options.

No. 1:  
d-band at E B = 4.9 eV

No. 2:  
d-band at E B = 4 eV

No. 3:  
d-band at E B = 3 eV

No. 4:  
d-band at E B = 2.2 eV

No. 5:  
sp-band at EB = 1 eV

No. 6:  
surface state and sp-band at EB  
= 0 eV

This result has been obtained with : **OMICRON NanoESCA**