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**S E M I N A R**  
**aus**  
**Halbleiterphysik und Nanotechnologie**

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**Adsorption of DHTAP molecules on Cu(110) : from single  
molecules to multilayer films**

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Recently azaacenes have received increased attention due to their potential use as organic semiconductors. These molecules are of interest because of their enhanced environmental stability as compared to their acene analogs. Besides the environmental stability, the crystallinity of the organic layers is a crucial point for the electrical performance of the semiconducting layers. For this reason we have undertaken intensive studies of the adsorption and growth of dihydroazapentacene (DHTAP) on a Cu(110) surface using scanning tunneling microscopy (STM), low energy electron diffraction (LEED), and reflectance difference spectroscopy (RDS). In the first monolayer three distinct superstructures can be observed, which depend on the deposition temperature and the coverage. In all of these structures, the DHTAP molecules are chemisorbed via the N atoms and are aligned along the densely packed Cu rows. Due to the strong coupling of the molecules to the surface no optical signature could be obtained in the RD spectra. For coverages above the monolayer up to three monolayers ordered thin films are observed. By combining the STM and RDS results the structure of these films can be elucidated. Again, the structure of these films strongly depends on the deposition temperature and the film thickness. The decoupling of the thicker layers from the metallic substrates results in a clear optical signature, which can be attributed to the optical transitions of the DHTAP molecule. Finally, the results obtained on Cu(110) will be compared to the growth of DHTAP films on the Cu(110)-(2x1)O surface, for which comparable properties have been found.