

UNIVERSITA' DEGLI STUDI DI TRIESTE

DOTTORATO DI RICERCA IN FISICA

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Research Program:

Electron states of self-aggregated systems on single crystal surfaces.

We plan to investigate the relationship between electronic/magnetic properties of self aggregated systems at surfaces and local structure/morphology.

A key ingredient of such study is the in-situ synthesis of the interface and the characterization of the local order and morphology of the ultrathin film by Scanning Tunneling Microscopy, prior to electron state analysis. This part of the study will be based on the in-situ STM facility at the APE beamline, which is capable of atomic resolution and will be upgraded to new low noise electronics within the first quarter of 2006.

Several self-aggregated systems will be studied. The first class of materials to be addressed is the molecular self aggregation of pentacene on metal surfaces. The full STM analysis of substrates and interface layers of pentacene on metals should be reached within the first year. Next, it will follow the STS and photoemission analyses.

Further self-organised systems, that will be studied, will extend to the magnetic analysis of interface phases, by using the full set of surface magnetometry techniques at the APE beamline, naming X-ray magnetic circular dichroism and Keer effect. For instance, we are intent on study magnetic properties of MnAs films grown on GaAs and the $\text{Fe}_{1-x}\text{Rh}_x$ alloys.

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