**СОФИЙСКИ УНИВЕРСИТЕТ**
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# ФАКУЛТЕТЕН СЕМИНАР

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## Behavior of non-planar molecules on quasicrystalline and metal surfaces


The elaboration of highly ordered organic films on different substrates provides a new route for further surface functionalization required for potential application in nanodevices. Careful selection of molecular building blocks endowed with properly tailored symmetry and functional groups is recognized as an efficient method to achieve this goal due to better control of thin film epitaxial growth, intermolecular and molecule-substrate interactions. However, studies on the stability of such surfaces are not least important in attempting to optimize their performances as components of nanodevices, i.e. to guarantee efficiency, life-time and safety.

In the last years several works on the fabrication of ordered aperiodic organic layers on different Al-based quasicrystalline surfaces were successfully performed due to the symmetry matching between C60 molecules and underlying substrates. Subsequent work devoted to fullerene thin films growth on the Ag-based quasicrystal revealed the non-universal character of this approach because of the formation of a disordered organic layer on this substrate. Here, the tessellation of the 5-fold i-Ag-In-Yb quasicrystalline surface with non-planar C20H10 corannulenes that are structurally related but stereochemically different from C60 molecules will be described. In contrast to disordered C60 thin film, the corannulenes adsorbed on i-Ag-In-Yb surface assemble into a quasiperiodic molecular network as evidenced from LEED and STM studies. The most prominent local STM features are decagonal molecular rings resulting from the corannulenes anchored with their convex side down at specific adsorption sites with local pentagonal symmetry. Compared to C60 deposition on the same substrate, the presence of CH substituents on corannulene rim seems to increase the molecules mobility on the surface and facilitates their trapping at specific sites.

The effect of adsorbate on the stability of underlying surface will also be presented. For instance the deposition of non-planar vanadyl phthalocyanine (VOPc) molecules on Cu(110) leads to a drastic surface reshaping at room temperature that is further enhanced upon moderate annealing. The surface undergoes mesoscopic faceting of step edges with growth of sawtooth-like structures and gradual disappearance of terraces. Freshly etched steps are composed of regularly arranged chiral kink sites decorated with VOPc molecules.