O 90: Overview Talk Karl-Heinz Ernst

Time: Friday 9:30–10:15 Location: TRE Phy

Invited Talk O 90.1 Fri 9:30 TRE Phy

Molecular Surfaces With a Twist: Magnetochiral Asymmetries and Topological Self-Assembly — •Karl-Heinz Ernst — Empa, Swiss Federal Laboratories for Materials Science and Technology, Dübendorf (Switzerland) — Nanosurf Laboratory, Institute of Physics, The Czech Academy of Sciences, Prague (Czech Republic) — Department of Chemistry University of Zurich, Zurich (Switzerland)

Surfaces functionalized with helically shaped aromatic hydrocarbons, so-called helicenes, are of interest for chiroptical electronic devices or for electron spin filtering. After a general introduction into the topic we will report a unique transmission of chirality from single polyaromatic hydrocarbons into two-dimensional self-assembled monolayers on a silver surface. A helicene with relatively high molecular flexibility allows adaptation of handedness during crystal growth which is governed rather by entropy than by enthalpy. The layer is dominated by motifs, such as nodes of different topology, i.e., two-armed and three-armed spirals, and by enantiospecific lateral offset of oligomeric triangles. To our knowledge such chiral self-assembly phenomenon has been neither reported previously nor has such aperiodic tiling of the plane been previously described by geometers. Moreover, we will report spin-selective electron transport phenomena and enantioselective magnetochiral interactions of helicenes with ferromagnetic surfaces by means of photoelectron spectroscopy, spin-polarized low-energy electron microscopy and spin-polarized scanning tunneling microscopy.