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Chirality and magnetism: Insights from surface science

physikalisches

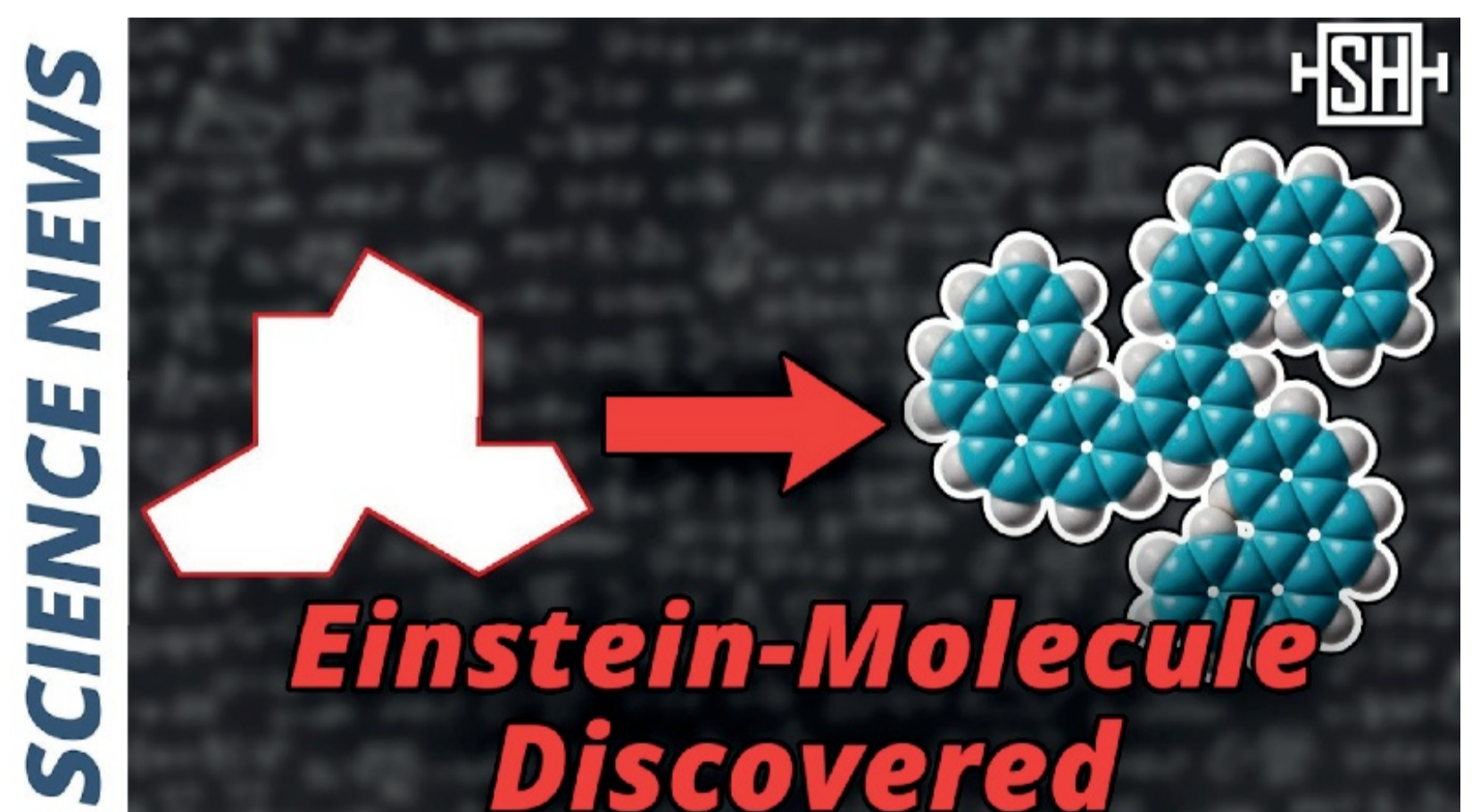
Mo. 4.5.26
16:00 Uhr
Ort: H34

Since Pasteur's discovery of molecular chirality, the relationship between chirality and magnetism has remained a subject of debate. In 1894, Pierre Curie argued that coupled electric and magnetic fields could induce chirality under non-equilibrium conditions. We now revisit this historical debate by showing that chirality and magnetism can indeed couple at the molecular scale in different, complementary ways.

First, we demonstrate enantioselective adsorption of single helicene molecules on ferromagnetic cobalt surfaces. Spin- and chirality-resolved scanning tunneling microscopy reveals that left- and right-handed helicenes preferentially adsorb on Co islands with opposite out-of-plane magnetization.

Second, tunneling conductance measurements through individual enantiomers yield magneto-chiral asymmetries of up to 50%, excluding ensemble effects as the sole origin of chirality-induced spin selectivity (CISS).

Finally, we will report the first observation of aperiodic chiral tiling of molecules topologically self-assembled on a silver surface.



Title of podcast related to topological aperiodic chiral two-dimensional self-assembly