

O 112: Overview Talk STM and Molecular Machines: Karl-Heinz Ernst

Time: Friday 13:15–14:00

Location: HSZ 01

Invited Talk

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Helical Molecules and Surfaces: Self-Assembly, Spin Filtering and Unidirectional Motors — ●KARL-HEINZ ERNST — Empa, Swiss Federal Laboratories for Materials Research and Technology — Department of Chemistry, University of Zurich

The Nobel Prize for Chemistry 2016 is shared by Jean-Pierre Sauvage, J. Fraser Stoddard and Ben Feringa for the development of molecular machines. The three researchers designed molecules with subunits that moved relative to each other in a controlled manner, and therefore founded a new field in chemistry. Some of their molecules can,

for example under influence of light, even fulfill work, and laid the foundation for nanoscopic motors, like molecular escalators, molecular muscles and nanocars. These functional molecules are believed to have a large potential and it is expected that they become useful some days in nanomedicine or as intelligent materials.

After brief introduction into artificial devices based on natural motor proteins I will present our involvement in the realization of the first successful electrical current-driven, unidirectional motion of a synthetic molecule designed and synthesized by the Feringa group. Moreover, we very briefly report spin-dependent filtering of electrons by monolayers of helical molecules.