

Molecular Landers

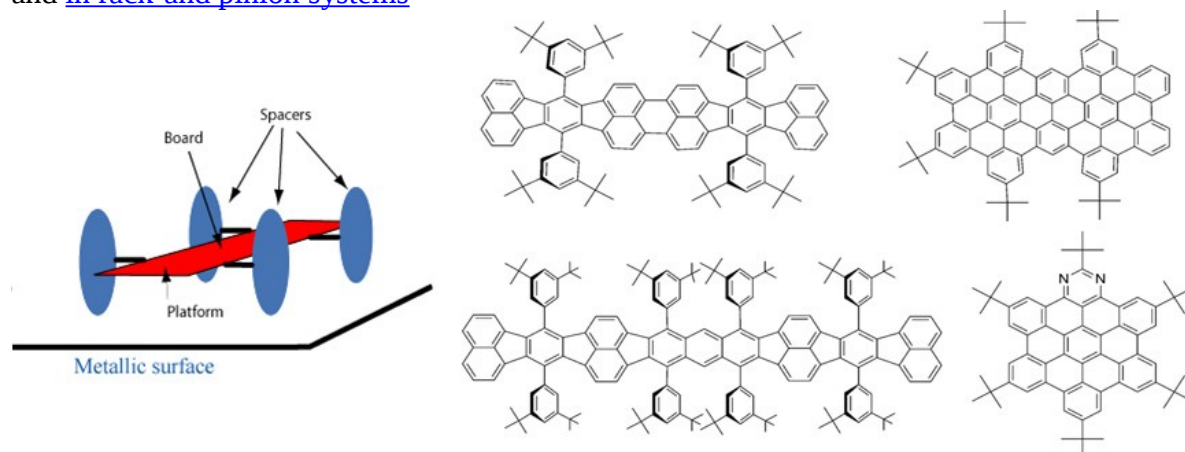
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Despite the current interest in electron transport studies of molecular-scale systems, little is known on, for instance, the influence of chemical structure, molecular conformation or molecule-electrode contact on conductance of molecular wires.

Full understanding of the parameters controlling the electron transport properties requires sub-molecular imaging by STM during the electron transport measurement as it has been recently done with carbon nanotubes between two electrodes. Along these lines we have developed molecular **landers**, comprising a rigid polyaromatic main board (wire, device), maintained above a metallic surface by spacers at a distance large enough so that the electronic coupling between this molecular wire and the metal is very small. These insulating spacers are also poorly coupled to the main board and to the surface to avoid as much as possible electronic leakage. The end of the board extends beyond the spacers and can be used to connect metallic terraces. This type of molecules has been used to measure the variation of conductance, the contact conductance of a single molecule, to [mould and trap metallic atoms](#) and [in rack-and pinion systems](#)



Concept and examples of different families of landers

Selected references:

Concept and synthesis: *EurJOC* (1998) 2797; *Proc. Natl. Acad. Sci. USA* (2005) 102(25), 8809; *Synthesis* (2003) 10, 1521; *Eur. J. Org. Chem.* (2007) 136; *Tetrahedron* (2009) 65, 3767.

Experiments: *Phys. Rev. B* (2002), 075410, 1; *Angewandte Chemie, Int. Ed English* (2004) 43, 2091; *Nanoletters* (2005) 5:5, 859; *Chem. Phys. Letters* (2006) 428, 331; *Chem.Phys.Chem.* (2006) 7, 1917;