



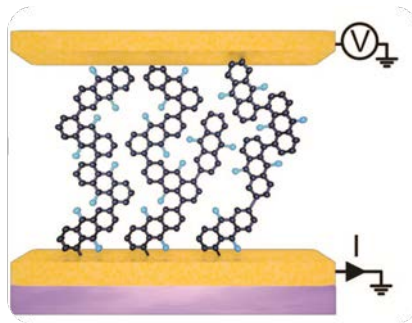
Mercredi 24 Septembre 2014 à 11h15

Orme des Merisiers SPEC, Salle Itzykson, Bât.774

Quantum Interference and molecular electronics

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Quantum interference is a hallmark of quantum mechanics and a well-known phenomenon in mesoscopic physics. The ability to control this effect at the molecular level is a recent development of molecular electronics that could improve knowledge and control of electron transport through molecular systems. In cross-conjugated molecules, such as anthraquinone, the interference is due to different paths through the molecular orbitals of the molecule. The expected signature of quantum interference in molecular system is an antiresonance in the electron transmission function resulting in a strong suppression of conductance. In such systems, it could be possible to tune the conductance over orders of magnitude by chemical design. I will review recent results demonstrating the importance of destructive quantum interference in various molecular junctions and I will show our measurements of the differential conductance of anthraquinone layers electrochemically grafted in large-area junctions. We have found direct experimental evidence of a large antiresonance in conductance visible at room temperature with a strong enhancement at low temperature. The visibility and robustness of this effect on large area junction confirms the dominant intramolecular charge transport mechanism occurring in the molecular layer. Finally, enhancement of thermoelectric effects by quantum interference in two terminal molecular junctions will also be presented.

A coffee break will be served at 11h00. The seminar will be given in English.