

## FROM HYBRID TO MONO-MOLECULAR LOGIC GATES

*C. Joachim*  
*Nanosciences Group*  
*CEMES-CNRS*  
*29 Rue J. Marvig*  
*BP 94345*  
*31055 Toulouse Cedex*  
*France*

In Molecular electronics [1], one molecule can be: (a) a simple device mimicking the electrical behaviour of a rectifier (1974), a switch (1986) or an amplifier (1997), (b) a complete classical electronic circuit embedded in a large molecule (1984) or (c) a full logic gate using intramolecular quantum behaviour with no resemblance to an electronic circuit [2]. After discussing how to control intramolecular time dependent quantum dynamics to get a Boolean algebra [3], a current drive single molecule NOR-AND logic gate is presented based on a simple dinitro-anthracene molecule [4]. Supporting this design, experimental of single molecule - molecular orbitals imaging are presented [5] together with a new multi-electrode atomic scale planar technology to interconnect this molecule logic gate to a large number of metallic nanopads on a passivated semi-conductor surface [6].

### References:

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