



Pico-Inside



**EUROPEAN
COMMISSION**



Pico-Inside

**Computing inside a single molecule
using atomic scale technologies**

**IST-FET (Priority 2)
Contract n° 015847**

<http://www.PicoInside.org>

Coordination:
Christian Joachim
CEMES-CNRS, France
joachim@cemes.fr

Dissemination:
Antonio Correia
Phantoms Foundation, Spain
antonio@phantomsnet.net

The Pico-Inside consortium (www.PicoInside.org) from the Future and Emerging Technologies (FET) part of EC IST programme, brings together 13 academic institutes and industrial organisations across Europe that are leaders in nano-science. Over the next 3 years this project will explore atomic-scale technology to integrate a logic gate in a single molecule with all the physical access to the “in and out” binary information always on the same molecule.

In Pico-Inside, you can meet 15 of the most talented academic and industrial research groups in Europe working together on:

1. New intramolecular architectures for integrating a complex digital logic function inside a single (and always the same) molecule.
2. Understanding the electronic and mechanical behaviour of a single molecule on a surface with the best LT-UHV-STM and UHV-NC-AFM instruments in Europe.
3. The 4 stages of the interconnection problem from the atomic to the macroscopic scale: 50 pm to 5 nm (atomic wires), 5 nm to 50 nm (mesa island), 50 nm to 5 µm (nanostencil), 5 µm to 1 mm (micro-cantilever array) and the related surface science theory of interconnects.
4. Organic chemistry for synthesising the molecule holding the intramolecular logic gate board and all the lateral chemical groups equipping the final molecule to perform on a surface.
5. Theory of large molecule surface science including molecular structure extraction for the experimental STM and NC-AFM images.

UNITS

Unit 01: Architecture

Unit 02: Intramolecular Phenomena and Atomic Scale Interconnects













Unit 03: Atomic Scale Technology

Unit 04: The Chemistry

Unit 05: Theory on Single Molecule on Surface

Unit 06: Dissemination

CONSORTIUM

GROUP / INSTITUTION	COUNTRY	UNIT	
CEMES-CNRS	France	01- 06	
LPTMC-CNRS	France	01	
LPM-CNRS	France	02	
Fujitsu Europe	France	01/05	
Freie Universität Berlin	Germany	02/06	
Jagiellonian University	Poland	02/03	
Universität Osnabrück	Germany	02/06	
Aarhus Universitet	Denmark	03	
Universität Basel	Switzerland	02/03	
Omicron Nanotechnology GmbH	Germany	02	
Institute of Organic Chemistry and Biochemistry	Czech Republic	04	
Institute of Chemical Research of Catalonia	Spain	04	
King's College London	United Kingdom	05	
University College London	United Kingdom	02/05	
Phantoms Foundation	Spain	06	