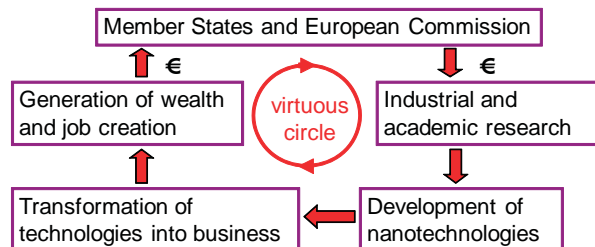


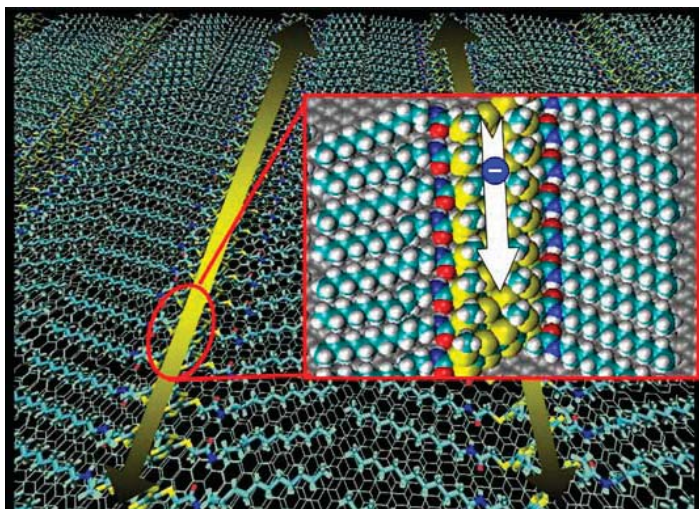
# Organic Nanomaterials for Electronics and Photonics

## Design, Synthesis, Characterization, Processing, Fabrication and Applications

The main goal of ONE-P is to position Europe as the leader of industrial development in the field of organic electronics and photonics by developing organic materials and their fabrication technology and thus helping the creation of a virtuous cycle:



Authors: Andrea Minoia, David Amabilino, Roberto Lazaroni



Model of the structure of a highly-ordered assembly of tetrathiafulvalene units (with the sulfur atoms in yellow) forming molecular-scale channels for charge transport (represented by the arrows). Collaboration between Université de Mons Hainaut and Consejo Superior de Investigaciones Cientificas.



The work plan has been composed of five technical objectives addressing current material challenges.

The first four are focussed on the development of organic:

1. semiconductors, dielectrics and conductors for air-stable electronic circuits.
2. semiconducting materials, electron donors and acceptors, for low-cost photovoltaics and photodetectors.
3. light emitter materials for light-emitting diode architectures and light-emitting field-effects transistors.
4. functional self-assembled monolayers, (i) which, at the interface between materials such as electrodes and semiconductors, improve the charge transfer and thus the efficacy of applications linked to the other objectives (ii) and for new applications such as rectifiers, switches, ultra-capacitors and sensors.

The fifth objective is focussed on:

5. processing and formulation of materials

This integration of materials, process and formulation is essential because materials performances often come from their clever formulation and processing and because from an industrial point of view it gives a better competitive advantage than a focus on materials only.

And three horizontal objectives:

6. dissemination and exploitation
7. cross-disciplinary training between partners and education of young researchers
8. management



### 28 partners and around 200 researchers are involved in the project

**Universities:** Université Libre de Bruxelles, Université de Mons Hainaut, University of Cambridge, University of Copenhagen, Linköpings Universitet, Chalmers University of Technology, Rijksuniversiteit Groningen, Westfälische Wilhelms-Universität Münster, Université de Strasbourg, Bergische Universität Wuppertal, University of Nova Gorica, University College London, Imperial College of Science, Technology, and Medicine Technische Universität Dresden

**Research centres:** Consejo Superior de Investigaciones Cientificas, Consorzio Interuniversitario Nazionale per la Scienza e Tecnologia dei Materiali, Max Planck Gesellschaft zur Foerderung der Wissenschaften, Consiglio Nazionale delle Ricerche, Interuniversitair Micro-Elektronica Centrum, Nederlandse Organisatie voor toegepast-natuurwetenschappelijk onderzoek

**Industrial partners and SMEs:** Philips Electronics Nederland, STMicroelectronics, Merck, Johnson Matthey, Basf, Scriba Nanotechnologie, VDI/VDE Innovation + Technik GmbH, Innova



The research leading to these results has received funding from the European Community's Seventh Framework Programme (FP7/2007-2013) under grant agreement n° 212311 of the ONE-P project