

# Invitation à la soutenance publique de thèse

Pour l'obtention du grade de Docteur en Sciences de l'Ingénieur

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Ingénieur civil en chimie et science des matériaux

**Nanoimprinted Ferroelectric Polymer Layers for Organic Memory Devices  
and Multiferroism**

Organic electronics has proven to be a promising technology for large-area electronic applications, such as foldable displays and electronic papers. To realize their functionalities, most of these applications need memory components to store information. For this purpose, memory devices based on organic ferroelectric polymers, e.g., P(VDF-TrFE), have been developed over the last decades and considered as excellent candidates.

In these devices, information (bits 1 and 0) is stored as two polarization states of the ferroelectric polymer. Therefore, the memory devices should be designed so that two stable polarization states can be easily obtained, with an easy read-out of the information which preferably does not alter the polarization states. This requires smart designs of device structures, proper usages of materials and processing conditions, and a fine understanding of the switching mechanisms of the ferroelectric polymer.

Since all these requirements are related to each other, the main objective of this thesis is to identify links between the main parameters, and to find optimized conditions to fabricate and characterize memory devices. To achieve this objective, the following work was conducted in this thesis: (i) a study of the switching mechanism of the ferroelectric polymer in ferroelectric field-effect transistors; (ii) an improvement of the memory performance by optimizing the processing conditions; (iii) the design of new device structures or materials which could be used for memory applications. Two new systems are investigated: the first one is a transistor-like device consisting of a hybrid layer with alternating ferroelectric/semiconductor nanowires and the second one is a nanopatterned multiferroic layer made of ferroelectric polymer and ferromagnetic metal. The switching mechanisms and the potential usages for memory applications of these two systems are demonstrated.

**Jeudi 15 septembre 2016 à  
15h00**

Auditoire Doyen 21  
Place des Doyens  
1348 Louvain-la-Neuve



**Membres du jury :**

Prof. Alain M. Jonas (UCL), promoteur

Prof. Jacques Devaux (UCL), président

Prof. Luc Piraux (UCL), secrétaire

Prof. Bernard Nysten (UCL)

Dr. Albert van Breemen (Holst Center/TNO, The Netherlands)

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