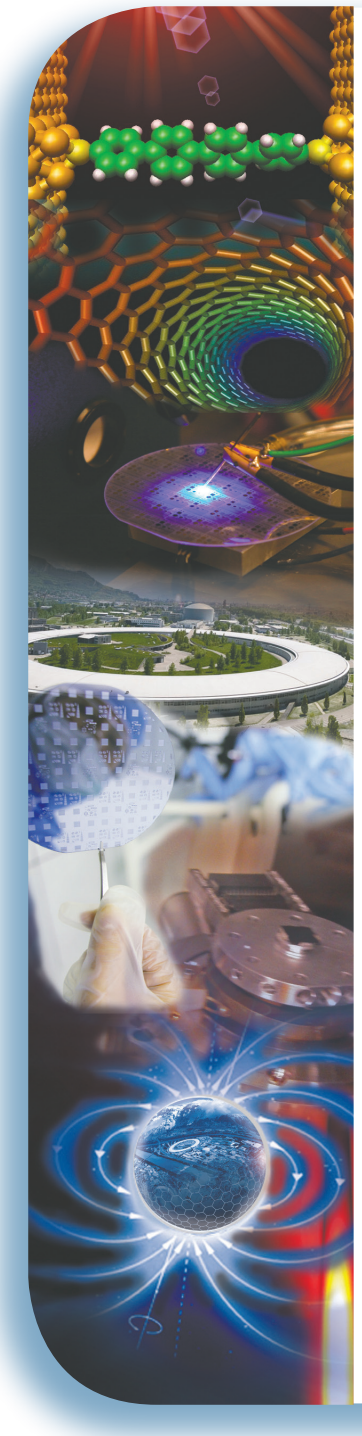

Les Séminaires de la Fondation
"Nanosciences aux limites de la Nanoélectronique"

Lundi 30 septembre 2013

à 10h00

KAN-HAO XUE

Laboratoire de Réactivité et Chimie des Solides
Université de Picardie Jules Verne - Amiens

présentera un séminaire intitulé :

Investigating the filaments in HfO_2 resistive RAMs through *ab initio* calculations

Amphithéâtre 3ème étage
Tour CNRS – Bâtiment A
25 rue des martyrs – 38000 Grenoble

nano SCIENCES FONDATION

Investigating the filaments in HfO_2 resistive RAMs through *ab initio* calculations

HfO_2 has been one of the leading candidate materials for resistive random access memory (RRAM). Nevertheless, still little is known regarding the structure of conductive filaments in these devices, though for Pt\$TiO_2$\Pt RRAM it has been convincingly identified that some Magnéli phases such as Ti_4O_7 constitute the filaments. In this talk an overview will be given on how a conductive tetragonal Hf_2O_3 phase was surprisingly obtained and thus predicted for experimental verification from our ab initio calculations. Moreover, a more detailed electroforming mechanism is proposed, involving a discussion on the lower limit of forming voltage in Pt\$HfO_2$\Pt cells. Finally, recent ab initio simulation results on HfO_2 grain boundaries will be discussed.

Kan-hao XUE is a former post-doc fellow of the Nanosciences Foundation who worked on the modeling of Resistance Random Access Memory (RRAM) at IMEP from October 2011 to May 2013. This talk will highlights some of the results he obtained within the frame of Pr Yoshio Nishi's Chair of Excellence project.