

Thales efforts in developing applications based on nanomaterials and nanotechnology: energy, spintronics, NVM memories and sensors

Paolo Bondavalli

Thales Research and Technology, France

Paolo.Bondavalli@thalesgroup.com

This contribution deals with the research efforts of Thales Research and Technology in developing nanotechnology for new potential products. The talk will deal with the recent efforts in the frame of the Graphene Flagship to develop flexible supercapacitors, the long-term research for applications dealing with spintronics, with the potential nanomaterial based flexible low cost memories and finally on sensors based on carbon nanotubes. The aim of the talk is to explain our approach and to give a sketch of the main research directions in the field of nanotechnology and nanomaterial.

Bio

Dr. Paolo Bondavalli, Msc, PhD, Hdr is the Head of Nanomaterial team at Thales Research and Technology (CNRS/Thales, UMR137) and he is a member of the Nanocarb Lab. (joint team Ecole Polytechnique/Thales). His research has principally dealt with carbon nanotubes gas sensors and silicon nanowires for biological detection. In the last two years, he is the first author of several scientific papers (see refs in project) dealing with CNTFET based sensors, supercapacitors and of 6 patents dealing with gas sensors, thermal management through CNTs, nanomaterials deposition, supercapacitors and memristor-like structures. Presently his work is focused on the development of new materials (e.g. graphene, cnts, nanowires) for the new generation of electronics devices and for energy storage applications and memristor. Dr Bondavalli has received his Hdr in 2011, at Paris-Sud on a work on "devices based on random network of carbon nanotubes". He is EU expert, and Vice-Chairman, for Marie Curie Fellowships (EIF, IIF, OIF, CIG, IRSES), NMP and ICT panel, for the French National Research Agency (ANR),

EDA, Eureka and reviewer for IOP, ACS, IEEE, ECS, Elsevier, EPJ B, Bentham, Taylor & Francis... During the last five years, he has participated, also as coordinator, in several EU projects (concerning MEMS, MOEMS, CNTs, graphene, spintronics) and ANR projects. He is involved in the Graphene Flagship initiative (Energy and High-frequency WPs).

Company profile

Thales Research and Technology (TRT) mission is to provide short-term and long-term competitive advantage to the THALES Group by transferring leading edge knowledge by injecting innovation. Through its internal activities and scientific links with industries and universities (such as INRIA, CEA, Ecole polytechnique), either in France or internationally, TRT is participating in the preparation of THALES industrial future in strategic R&D fields according to the Group's strategic priorities. With 270 skilled staff, 13000 sq. m of labs of which 1700 sq. m clean rooms, TRT research teams perform pioneering work in the most advanced areas. S&T skills, ranging from materials elaboration (epitaxy/deposition of various semiconductors, metallic, magnetic thin films, ceramics, polymers), through component modeling, processing, testing, assembly and packaging, to integration in appropriate demonstrators are available on site and allow full validation of the technologies investigated before their transfer to operational divisions of the THALES Group. Specifically, the Nanomaterial team (P. Bondavalli) at the Physics Department of TRT is composed by highly skilled scientists working on the development of new kind of nanomaterials (e.g. carbonaceous nanomaterials) for the new generation of electronic devices.