

# Séminaire de Chimie Autour des Nanosciences

## **MATHIEU PINAULT**

CEA-Saclay, DSM/IRAMIS/NIMBE/LEDNA

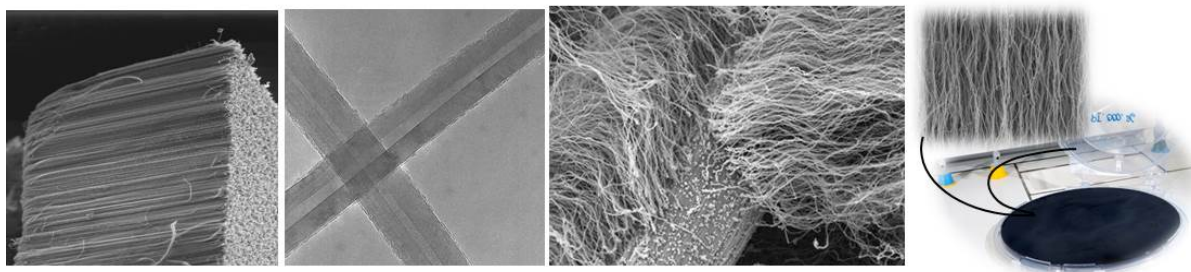
Service Nanosciences et Innovation pour les Matériaux, la Biomédecine et l'Energie

Donnera une conférence sur le thème :

## **VERTICALLY ALIGNED CARBON NANOTUBES AND GRAPHENE: GROWTH AND PROCESSING TOWARDS DEVICES OR ANISOTROPIC COMPOSITE MATERIALS**

The scientific objective of the LEDNA group is to develop a "bottom-up" approach of nanosciences in order to elaborate original nanomaterials, to understand their fundamental properties and to contribute to research areas of high societal impact. Research projects of the Carbon Nanostructures team that will be presented are concerned mainly by carbon nanotubes (CNT) and, since 2011, by graphene. The common origin of these studies is the catalytically assisted Chemical Vapour Deposition (CVD) process developed to synthesize both vertically aligned CNT (VACNT) carpets and graphene. The rapid growth of VACNT carpets together with the CNT alignment, their purity and macroscopic size open up a large variety of potential applications. In this context, our main objectives are to control and extend the synthesis process in order to produce VACNT on various substrates of different shape, nature and size and to finally up-scale such a process that has recently been implemented on a pilot scale (up to A4 surface) for the growth on any type of substrates (flat or flexible). Subsequently, a part of our work is also focused on the processing of VACNT carpets in order to get devices or composite materials and to study their properties. The study of their dispersion, functionalization and impregnation opens the way to many applications in the field of chemical sensors, composite materials and supercapacitors.

The team has also developed an expertise in the in-situ characterization of nanotube growth which is currently applied to graphene. The objective is to better understand its growth mechanisms in order to optimize its formation in terms of homogeneity, quality and size by developing CVD processes operating at ambient pressure.



Electronic microcopy (SEM and TEM) analyses of VACNT on various substrates of different nature, shape and size

**LE VENDREDI 14 MARS À 11H00**

**Bat. Lavoisier, salle 774, 15 rue Jean de Baïf 75013 Paris**

**Contacts :** Claire Fave et Vincent Noël,  
Tél : +33 (0)1 57 27 72 26/72 08