

DIRECTION DES SCIENCES DE LA MATIERE,
INSTITUT RAYONNEMENT MATIÈRE DE SACLAY

SERVICE DE PHYSIQUE ET DE CHIMIE DES SURFACES ET DES INTERFACES

SEMINAIRE *

Vendredi 27 Juin 2008 à 11h00
Bâtiment 466, salle 111 - CEA Saclay, 91191, Gif sur Yvette

The rise of graphene: role of Raman signatures

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Invité par Denis Fichou

Abstract : Graphene - a two dimensional monolayer of Carbon atoms is the most recent addition to the family of low-dimensional carbon, namely one-dimensional nanotubes and zero-dimensional fullerenes. After reviewing why graphene is so exciting, we will focus on our on-going work on single and bilayer graphene, with specific goals to understand phonons and Raman signatures of these systems [1]. The controlled doping of graphene is achieved by electrochemical top gated field effect transistor using solid polymer electrolyte [2, 3]. In-situ studies of phonons in single and bilayer graphene as a function of doping provide us with a measure of electron-phonon coupling in these systems. The results are quantitatively explained using ab-initio calculations that take into account effects beyond adiabatic approximation. An interesting comparison of graphene is made with our recent work on doped single wall carbon nanotubes[4].

- [1] Raman Spectroscopy of graphene on different substrates and influence of defects; Anindya. Das, B. Chakraborty and A. K. Sood. *Cond-mat.arXiv: 0710.4160 (October 2007)*, *Bull.Mat. Science* **31**, 1-6 (2008)
- [2] Monitoring Dopants by Raman Scattering in Top Gated Graphene transistor ; Anindya. Das, S. Pisana, B. Chakraborty, S. Piscanec, S. K. Saha, U. V. Waghmare, R. Yiang, H. R. Krishnamurhthy, A. K. Geim, A. C. Ferrari and A. K. Sood; *Nature Nanotechnology* **3**, 210 - 215 (2008).
- [3] Phonon renormalization in doped bilayer graphene, Anindya Das, B. Chakraborty, S. Pisana, A. C. Ferrari and A.K. Sood (2008).
- [4] Doping in Carbon Nanotubes Probed by Raman and Transport Measurements; Anindya Das, A. K. Sood, A. Govindaraj, A. Marco Saitta, Michele Lazzeri, Francesco Mauri and C. N. R Rao, *Phys. Rev. Lett.* **99**, 136803 (2007).

* SERA PRECEDE D'UNE PAUSE-CAFE A PARTIR DE 10H30

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