



SEMINAIRE

(de 13 h à 14 h, amphithéâtre, Bât. INP, MINATEC,
ouvert aux chercheurs des autres laboratoires)

Jeudi 8 avril 2010

“Multi scale device simulations:
from organic electronics to molecular devices”

by Aldo Di CARLO

Abstract: The advent of the organic electronics/optoelectronics and the introduction of new devices and concepts based on molecular functionalities require the development of a new class of simulators able to capture nanoscale details as well as the macroscale device context. In this talk I will present some results of the attempt to describe these systems and devices by using multiscale/multiphysics approaches in connection with conventional simulators as well as with a new Technology CAD, TiberCAD [1], which has been developed specifically for multiscale descriptions. Examples of application will cover the interplay between mobility and grain sizes in organic TFTs [2], organic solar cells [3], and the relation between current flow and power dissipation in molecular devices [4].

References:

- 1) M. Auf der Maur et al., *Optical and Quantum Electronics* 40, 1077 (2009).
- 2) A. Di Carlo et al., *App. Phys. Lett.* 86, 263501 (2005).
- 3) A. Gagliardi et al., *J. Comp. Electronics* 8, 398 (2009).
- 4) G. Schulze et al., *Phys. Rev. Lett.* 100, 136801 (2008).

Aldo Di Carlo is associate professor of optoelectronics and leader of the Nano&Optoelectronic research group (<http://www.optolab.uniroma.it>) of the University of Rome “Tor Vergata” (Italy). His research interests mainly focus on the charge transport in nanostructured systems and in organic devices. Recently, particular attention has been given to the development of the non-equilibrium theory for the microscopic description of the transport process in nanostructured devices and its multiscale implementation. Since 2006 he is co-director of the Centre for Hybrid and Organic Solar Energy (CHOSE) of the Lazio Region-Italy. CHOSE involves more than 30 researchers for the development and industrialization of the Dye Sensitized Solar Cell technology. Aldo Di Carlo is author/co-author of more than 200 scientific publications on international journals, of 6 patents, several book chapters and co-author of two books of optoelectronics.

*Institut de Microélectronique, Electromagnétisme et Photonique
MINATEC, INPG, 3 Parvis Louis Neel, BP 257, 38016 GRENOBLE CEDEX 1, France
Tél. +33 (0) 456.529.503 - Fax. +33 (0) 456.529.501
UMR 5130 CNRS INPG UJF
Institut Polytechnique de GRENOBLE*