



SEMINAIRE

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

Jeudi 7 février 2013

“Droplet based Microfluidics”

par Vincent SENEZ

Abstract: After a short introduction about wettability of homogenous and heterogenous surfaces, we will show how roughness at microscale can give ‘super’-wetting properties (superomniphobic surfaces) to these surfaces. We will explain how we have fabricated such surfaces using either semiconductor or polymer surfaces. Finally, we will explore several of their features, namely their static wetting, the adhesion of liquids on these surfaces and their robustness.

The second part of the talk is dedicated to the use of these surfaces in various applications using lab-on-a-chip technology. We will introduce several approaches to move droplets on surfaces using electrowetting, photowetting and surface acoustic wave. We will show how to optimize these technologies to make them robust and reduce the energy consumption. Finally, we will present several applications coupling electrowetting and biosensing.

Vincent Senez received the engineer degree from the “Institut Supérieur de l’Electronique et du Numérique (ISEN)”, Lille, in 1990 and the PhD degree in electronics from the University of Lille in 1995. He entered the Centre de la Recherche Scientifique (CNRS) as a junior researcher in 1999 and was promoted to senior research scientist in 2008. From 2002 to 2004, he was a visiting scientist at the University of Tokyo in the group of Prof. Teruo Fujii. He is professor at ISEN engineer school since 2005 and head of the BioMEMS group at the Institut d’Electronique, de Microélectronique et de Nanotechnologie (IEMN) since 2007. From 1992 to 2002, Vincent Senez was working on 2D/3D numerical modeling and simulation of residual mechanical stresses and their effects in silicon micro technologies as well as on the diagnostic and optimization of advanced silicon technologies. Vincent Senez is involved in microfluidics technologies and their applications since 2002. His current areas of interest cover digital microfluidics and electrical biosensors for real time, label-free monitoring of bio-cellular systems.

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