



SEMINAIRE EXCEPTIONNEL

(de 13h à 14h, Salle Belledonne, IMEP-LaHC, Minatec,
ouvert à tous : enseignants, étudiants, chercheurs, administratifs, techniciens)

Jeudi 14 septembre 2017

“Synthesis of carbon based hybrid nanocomposites as new materials for photovoltaic applications and ultrastable metal nanoparticles applied to biomedical applications”

by Prof. Erwan RAUWEL

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Abstract: During the last decade composite materials have spurred a large interest and with the rising of nanotechnology, the development of new nanocomposite materials promoting new properties has taken a step forward. The photoluminescence of carbon based hybrid nanocomposite consisting of non-functionalized multi-walled carbon nanotubes and metal oxide nanoparticles (ZnO, HfO₂) have been investigated. Surprisingly, photocurrent generation under UV-visible illumination has been observed and suggests these hybrid system have promising features for being used as flexible nanodevices for light harvesting applications.

Metallic nanoparticles (MNPs) have received extensive attention during the past decades due to their high potential applications. We have developed a method of synthesis that enables the production of surfactant free stable MNPs under air. Their stability in air allows applications that are usually difficult to implement with metal nanoparticles due to their pyrophoric properties. Ultrastable metal nanoparticles (Ag, Co and Ag-Co nanocomposites) have been studied for antimicrobial/fungal applications. To validate a potential use, their toxicity was also studied using Human Cells and cancer cells showing a higher toxicity against cancer cells. It is also possible to synthesize nanocomposites combining cobalt and silver MNPs and the properties of these nanomaterials will also be discussed in terms of possible utilization for biomedical applications and environmental remediation.



***Prof. Rauwel** comes from France where he defended his PhD of Materials Chemistry in 2003 at the University of Caen, CRISMAT and then defended his Habilitation in 2012. He held a postdoctoral position Minatec, Grenoble (2004), Research fellow at the University of Aveiro with a Marie Curie EIF grant (2006) and University of Oslo as senior researcher with a Marie Curie support grant (2009) he is now Professor at Tallinn University of Technology, Tartu College, and he is more particularly interested in the study of metal and metal oxide nanoparticles for biomedical applications and energy harvesting. He is consulting editor for International journal of Nanomedicine and has been Guest Editor for Special issue on silver nanoparticles. He has published over 57 scientific papers, 4 book chapters and he owns 4 international patents in the field of thin film deposition and nanoparticles synthesis. He is coordinator of a research project on metal nanoparticles applied to biomedical application and is involved in a Centre of Excellence “EQUiTANT” till 2023.*

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