PhD position opening

Université de Bordeaux

Ecole Doctorale Sciences Physiques et de l'Ingénieur (ED 209) – Spécialité Electronique

« Electroluminescence of Hybrid Perovskite semiconductors : towards highly efficient and stable white PeLED »

Project description:

Within the last 5 years, tremendous efforts have been pursued in the use of hybrid perovskite materials, such as $MAPbI_3$ for example, in solar cells. However, these new materials are wonderful novel semiconductors that can also be used in other optoelectronic applications[1]. Light Emitting Diodes (LED) represent one of the exploratory field of Hybrid Perovskites with recently published promising results[2].

The PhD program proposed here will deal with the fabrication, the characterisation and the optimisation of Perovskite LED (PeLED). After achieving monochromatic PeLED, the research will envisage the emission of white light for lighting application. Specific attention will be paid on the chemical nature of the material, its crystallinity, its processing conditions (solution or vacuum processed), its toxicity assessment, and the stability of resulted devices versus different kinds of encapsulation and environmental conditions. The main goal on the project is to assess whether PeLEDs represent a promising technology for light emission applications in the near future.

Location : The PhD student will be based at the University of Bordeaux / Bordeaux INP in the IMS Lab, UMR CNRS 5218, ENSCBP, 16 Av Pey Berland, 33607 PESSAC, France.
Multiple research stays at CEA-LETI in Grenoble will be envisaged along the 3 year program, as necessary as a function of scientific progress.

Facility : In Bordeaux, the PhD student will have access to the ELORGA team equipments located at IMS (ENSCBP). Access to the ELORPRINTTEC clean room facility will also be envisaged as a function of technical needs.

Starting date : Depending on applicant availability: not sooner than October 2017; no later than February 2018.
Duration: 36 months, expected PhD graduation end 2020 (early 2021).

Profile: We are looking for an autonomous and hard worker young scientist. Recently graduated from Master or "diplôme d'ingénieur" in Physics and/or Chemistry, the applicant needs to be skilled in technology, thin film deposition, solid-state physics, semiconductors, optics and optoelectronics. Experience in Organic Electronics (OLEDs and/or OPVs for example) is a plus. Knowledge of hybrid perovskite materials is a plus. Experience in fabrication of thin film devices in clean room environment is a plus.

Supervisors : Guillaume WANTZ (IMS, Bordeaux) & Tony MAINDRON (CEA-LETI, Grenoble)

Funding : Co-funded project by CEA-LETI (Grenoble) and the Labex AMADEUS at the Université de Bordeaux.

Application: CV + Letter of motivation + 2 reference letters from former advisor/professor to be sent to guillaume.wantz@ims-bordeaux.fr and tony.maindron@cea.fr; there is no deadline for application, however keep in mind that this position will be filled as soon as a solid applicant is identified.

[1] Snaith, *Science* (2012) ; Graetzel *Nature* (2013) ;
[2] Friend *Nature Nanotechnology* (2014) ; Tae-Woo Lee *Science* (2015) ; Sargent *Nature Photonics* (2016) ; Rand *Nature Photonics* (2017)