Post-doctoral position

LaserMicroFab is a FP7 IAPP Marie Curie project of the European Commission. It involves Oxford Lasers (UK) as industrial partner and NTUA (Greece) and CNRS-LP3 (France) as academics. The general goal of this project is to develop Laser digital micro-fabrication processes such as selective laser micro and nano-patterning, laser micro-curing and laser micro-printing for precision patterning of complex materials, such as metallic nanoparticle (NP) inks and organic materials.

The main activities of this post-doctoral position will be focused on 'selective micro and nano-structuring of thin films' and 'laser micro-printing'.

A critical issue in laser nano-structuring of thin films is related to the morphology of the laser ablated areas and their edges. In particular, the fabrication of organic electronics devices demands large area processing of thin film layers with sharp ablated edges free of ridges or delamination, to avoid any detrimental effects on the device performances. The study will address more specifically the patterning of a thin metallic layer (50nm) deposited on a plastic foil, and the nano-structuration or organic multilayer films. The ablation mechanisms will be studied and optimized as a function of the irradiation parameters (λ, τ, fluence …) and a specific attention will be paid to the influence of the beam energy profile.

The laser micro-printing process, which is also known as laser induced forward transfer (LIFT), has demonstrated its great ability to print with high resolution a wide range of organic, inorganic and biological materials. In the frame of this post doc, LIFT will be used to print nanoparticle silver inks for interconnection purpose. The process will be optimized to improve the size of the printed patterns and to determine the limitations of this process in an industrial context.

Together with these optimization studies some laser applications will be developed in the field of the heterogeneous integration for plastic electronics. In particular, we will address the realization of thin film organic transistors (OTFTs) and the printing of passive compounds on flexible substrates.

Required skills: Optics, Laser-matter interaction in short pulse regime, characterization (SEM, AFM, Confocal microscope)

Duration: 18 months from September 2013

Venue: LP3 laboratory, campus de Luminy, Marseille, France

Net salary: ~ 3000€

Conditions: Applicant must have worked less than 12 months in France during the last 3 years

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Project website: http://lasermicrofab.ntua.gr/

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