Title: Depth profiling for advanced nano and opto-electronic applications

Speaker: J-P Barnes

Affiliation: Univ. Grenoble Alpes, CEA, LETI, DPFT, SMCP, F-38000 Grenoble

The use of a large variety of materials in increasingly complex structures drives the need to develop depth-profiling techniques and methodologies for nanoelectronic applications. The complexity of the structures to be analysed means that often several techniques must be combined to answer the analytical question. This talk will address development in depth-profiling for applications from semiconductor technology to display technology.

Firstly, development in rapid depth profiling for process control and development in the clean room will be discussed. The use of plasma profiling time of flight mass spectrometry (PPTOFMS) and how it can be used together with SIMS analysis will be presented [1]. Secondly, strategies to analyse complex heterogeneous samples will be addressed. This will include the use of measurements that average over an ensemble of identical objects, and when the lateral resolution of the beam permits, 3D depth profiling techniques. Examples will be given of the correlation of SPM and TOF-SIMS to correct the 3D volume acquired by the TOF-SIMS and bring other pertinent information such as electrical properties [2]. Lastly, the possibility to extract highly localized TOF-SIMS depth profiles on sub-micron sizes areas will be demonstrated [3].