

We are looking for a candidate for a:

3-year PhD Position @ CEA Grenoble, France

Lab 1: Electronics and Information Technology Laboratory (Leti), System Department

Lab 2: Institute for Nanoscience and Cryogenics (INAC), Physics of Materials and Microstructures Laboratory

Both labs are located on CEA Grenoble site.

Subject: Experimental and theoretical investigation of the impact of geometrical, interfacial, structural and environmental effects on the piezoelectric properties of very long GaN nanowires – application to the design of a very compliant strain sensor.

Description:

Leti and INAC collaborate in a project which aims to study the collective behaviour of self-organised piezoelectric nanowires in view of designing and developing a new concept of conformable strain sensor. Unusually long GaN nanowires of controllable geometries and doping are produced at INAC by Metal Organic Vapor phase Epitaxy (MOVPE). Self-organisation is carried out at Leti from suspensions onto a range of inorganic and organic substrates by Langmuir-Blodgett or field-driven deposition techniques.

The objective of the 3-year project is to investigate both the internal characteristics of the nanowires (lattice defects, internal stress, surface state, overall geometry, doping) and the nature of their interactions with their environment (surrounding nanowires, encapsulating materials, electrodes, substrate) in order to assess their sensing performances and potential as a future generation of flexible, conformable sensors. In addition to nanowire growth and self-organisation experiments, work will include thorough piezoelectric and structural measurements (SEM, x-ray, PL) as well as the systematic validation of the associated finite element model (COMSOL). The latter constitutes a fundamental tool for subsequent device design optimisation.

The candidate will demonstrate the willingness to work in a multidisciplinary environment, combining synthesis and self-organisation methods, characterisation techniques and modelling tools. We would appreciate experimental skills and scientific background in solid state physics and/or nanoscience; knowledge of finite element method and computing (COMSOL) is a plus. The candidate must also be fluent in English to communicate in the laboratory and write scientific papers.

Candidates should have a master's degree, preferably obtained outside of France. Funding is to be awarded based on excellence criteria (please provide complete statement of University exam results and the name of 2 referees). Proposals for grant application must be constituted before April, 2nd 2013 (<http://www.fondation-nanosciences.fr/RTRA/fr/642/programme-des-doctorants-2013.html>).



Laboratoire d'électronique et de technologie de l'information

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