



## Postdoctoral position microelectronic SiC reliability at the device level by Atomic Force Microscope (AFM)

### Practical information

Candidate with a strong academic track record and a PhD in microelectronic or/and materials, passionate about nanoscale experiments

**University:** Normandie Université Caen

**Desired start date of the thesis:** 01-10-2023

**Duration:** 12 months

**Establishment / Location:** CRISMAT Campus 2 Caen

**Manager:** R. Coq Germanicus CRISMAT Laboratory 6 Bv Marechal Juin Bat G 14000 Caen

**Contact:** rosine.germanicus@unicaen.fr

**How to candidate:**  
by e-mail with a CV and motivation letter  
In French or English

The French CNRS research lab CRISMAT UMR6508, based in Caen Normandy, proposes a post-doctoral position on microelectronic. Significant technologies still need to be developed to aims the EU's net zero commitment by 2050 (transition to a climate-neutral society to reach zero-carbon). In this context, renewable energies are developing and European electricity markets have opened up to competition. The wide bandgap semiconductor (WBG) material Silicon Carbide (SiC) is an attractive proposition for the development of efficient power electronic devices and systems. Early adoption of SiC devices in a number of power conversion applications, including photovoltaic inverters, hybrid and fully-electric cars. Despite the intrinsic advantages of the SiC material, some reliability issues may arise, especially with integration of discrete devices into power module assemblies. For reliability testing; radiation effects (SEB: single event burnout) and electrostatic discharge (ESD); at the module and device level, a characterization of the structure of the discrete die at the wafer level is an essential component to fully understand the underlying failure mechanisms. Therefore, analysis with a local 2D-mapping of electrical properties of the semiconductor is a pertinent approach, complementary to other techniques. In this context, we are looking for a motivated postdoctoral research fellow to work on Atomic Force Microscopy (AFM) in electrical modes, coupled with mechanical methods for SiC devices. This project will be carried out in the SiC-Ageing Carnot ESP project, in collaboration with the Normandie University of Rouen, "Groupe de Physique des Matériaux" (GPM) UMR 6634 CNRS lab.

The methodologies will be based on experimental and physical simulations of the electrical, mechanical behaviors.

For applying to this Postdoctoral position, the candidate must have a PhD in microelectronic or/and materials. He/she should have a good knowledge of microelectronics, microelectronic manufacturing processes, electrical and structural characterization and component simulation. Knowledge of Atomic Force Microscopy (AFM) and/or Scanning Electron Microscopy (SEM) techniques, SiC material and devices can be an advantage.