



Institut Matériaux Microélectronique Nanosciences Provence

## Post-doctoral position in characterizations, simulations and experimental validation/test of calorimeter for absorbed dose rate measurement in nuclear research reactor

**Duration:** 18 months

Employee : Aix-Marseille Université

**Job Location:** Laboratoire IM2NP UMR 7334, Campus St. Jérôme, Avenue Escadrille Normandie-Niemen, 13397 MARSEILLE cedex 13

**Research field:** Thermal sciences, Instrumentation, Sensor, Metrology, Nuclear fission

### **Start date**

From June 2020

### **Location**

Laboratoire IM2NP UMR 7334, Equipe Microcapteurs-Instrumentation

Campus St. Jérôme, Avenue Escadrille Normandie-Niemen, 13397 MARSEILLE cedex 13

A postdoctoral position is available from June 2020 for a highly motivated post-doc fellow to join a research group specialized in microsensors and instrumentation based at "Institut des Matériaux Microélectronique Nanosciences de Provence" (IM2NP, UMR7334) in Marseille, France. The research group carries out works on calorimetry for online measurement inside experimental channel of research reactor such as Material Testing Reactor (sensor conception by simulation and theoretical calculation, experimental characterization under laboratory conditions, out-of-pile calibration, experimental test under real conditions, and analysis/interpretation) in the framework of a joint laboratory (AMU-CEA-CNRS) and thanks to several research programs. Thanks to A\*MIDEX funding, a research program dedicated to testing a sensor prototype in new real conditions and to comparing it with another technology began in January 2020. The post-doc fellow will conduct thermal simulations to optimize the calorimeter prototype for a future irradiation campaign (<2W/g). For that, the post-doc fellow will realize measurement of thermal properties of material samples versus temperature with laboratory devices. Then the post-doc fellow will carry out experimental studies of the sensor

response and the sensor calibration. The post-doc fellow will lead the development of an experimental cell including the sensor and instrumentation for these studies. The post-doc will use experimental benches existing in the research group. The post-doc fellow will do the calibration of associated temperature sensors. He/She will contribute to the preparation of a future irradiation campaign that will be done in 2021 abroad (multi-sensors devices, operating protocols, data acquisition systems). The post-doc fellow will have to go in USA to participate to the measurement campaign and he/she will have to analyze irradiation data by calculation and modelling.

**Skill requirements:**

- Solid French and English language skills (written and oral)
- Working experience in R&D of calorimeter for in-pile measurements
- Knowledge in nuclear interactions between rays and matter
- Extensive experience in thermal simulation by COMSOL Multiphysics
- Practical experience in thermal property quantification in particular measurement of thermal conductivity
- Practical experience in metrology (from calibration to uncertainty calculation)
- Strong experience in design and development of experimental set-ups
- Experience in irradiation campaign on instrumentation
- Great ability in writing of operating procedures and of technical and scientific reports

The candidate must be able to work on an autonomous basis, as well as demonstrate a strong commitment to teamwork with important organizational skills.

**Contact person:**

Christelle Reynard-Carette, [christelle.carette@univ-amu.fr](mailto:christelle.carette@univ-amu.fr)

**How to apply:**

Please, send your application (including a motivation letter, curriculum vitae, diploma, technical expertise, list of publications and two letters of recommendations) to [christelle.carette@univ-amu.fr](mailto:christelle.carette@univ-amu.fr)