PhD Fellowshhip Opportunity

The Radiation Detector Group (RDG) at the Microelectronics National Center (IMB-CNM) located in Barcelona (Spain) is looking for candidates to join our group to realize a PhD fellowship in **Nanodosimetry for improving radiobiology models.**

In recent years there has been a rapid implementation of advanced radiotherapy modalities, such as proton therapy or hadron therapy. In fact, in Spain it is planned to create ten new public proton therapy centers in various cities in the next four years. In this context, the measurement of the fluctuation of the energy deposited at the nano/micrometric scale has become one of the most relevant topics in radiobiology, since the effect of radiation on tissues is determined by the damage that is created in the DNA. Therefore, it is essential to characterize cell damage by measuring the nanodosimetric distributions that can generate DNA breaks. Since there are currently no radiation detectors with adjustable resolutions at these subcellular scales, we challenge to make a novel kind of nanosensors, a radiation detector device with single digit nanometer scale resolution which would involve developing a completely new nanofabrication-based technology at the IMB-CNM.

The research fellowship will lead to **becoming an expert in**:

- Semiconductor processing and nanofabrication (including some specific syntheses of nanomaterials)

- Advanced microscopies and spectroscopy (SEM, AFM, TEM, FIB, XRD, XPS, Raman, PL…)

- Characterization of the device (electrical functionality, effects of damage by irradiation with particles, study of charge collection as a function of incident energy)

- Nanodosimetry experiments in conditions equivalent to the clinical implementations

The first two elements would be directed by a specialist in nanotechnology (Dr. Gemma Rius) while the last two by another specialist in microdosimetry and pre-clinical experimental tests (Dr. Consuelo Guardiola).

Research center context:
The student will work in the IMB-CNM that is situated on the campus of the Autonomous University of Barcelona (UAB). IMB-CNM is the main microelectronics public research center in Spain and has one of the largest Clean-Room facilities for RDi in the Southern Europe. It has full capability to process its own CMOS technologies as well as specialized technologies such as photon/particle detectors. More information on CNM activities at: http://www.imb-cnm.csic.es/. The CNM offers support during the grant application procedure to the candidates.

Student Profile. We are looking for a motivated Physicist with:
- BsC in Physics, Micro and Nano technology or closely related field.
- Previous experience in radiation detectors is an asset.
- Experience in medical physics, proton/hadron therapy, or radiation detectors are valued.

Who can apply? Researchers who:

- Be in possession of an engineer or university graduate, with a degree of at least 240 ECTS credits (European Credit Transfer System), at the time of submitting the application.
- Applicants must have an average grade in their academic record corresponding to the bachelor's degree, degree or equivalent degree higher than 2 on the 0-4 scale (Passed-1, Outstanding-2, Outstanding-3, Honors-4). The average grade of the file will be the result of the application of the following formula: sum of the credits obtained by the student, multiplied each one of them by the value of the corresponding qualifications, and divided by the number of total credits obtained by the student.

Contact and additional information:
Interested candidates should send a CV and contact before 10th Nov 2022 to:

Dr. Gemma Rius (gemma.rius@csic.es) and **Dr. Consuelo Guardiola** (consuelo.guardiola@imb-cnm.csic.es)