Institute of Microelectronics of Barcelona IMB-CNM (CSIC)
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Call for Expression of Interest:

Marie Curie Individual Fellowship for post-docs

The **Radiation Detector Group (RDG)** invites researchers holding a PhD to express their interest in applying to a Marie Curie Postdoctoral (PF) Fellowship together with the topic below.

In RDG are experts on developing radiation detectors for high-energy physics, accelerators, medical physics, industrial, and radiation harsh environments.

Research topic that we are supporting for new applications:

Nanodosimeters for improving radiobiology models

Motivation: The measurement of the fluctuation of the energy deposited at the nano/micrometric scale has become one of the most relevant issues 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 the cell damage by measuring the nanodosimetric distributions that can generate DSB (double strand break) or SSB (single strand break). Knowing these distributions would help to accurately determine the biological efficacy of radiation-induced cell damage. Currently the nanodosimetric distributions are simulated with Monte Carlo codes, e.g. Geant4-DNA. However, carrying out experimental measurements at the nanometric level would have a direct impact on the verification of such approximations.

Proposition: there are no radiation detectors with resolutions adjustable to the sub-cellular scales, i.e. few nanometers. Making sensors at these scales implies developing a new technology based on nanofabrication at the CNM, as well as building a specific experimental set-up in which to evaluate these sensors.

Innovations:
(1) Develop the first generation of nanodosimeters based on nanowire and novel materials-based electronic devices.
(2) Measure for the first time the dose deposited at the nanometre scale

This project will use two key unique infrastructures:

- An advanced micro and nano manufacturing facility (CNM clean room) where the devices will be manufactured, and
- A particle accelerator facility where sensors can be irradiated under the relevant conditions. Secondments will be performed in the National Center for Accelerators.

Successful candidate will have access to the RDG lab and the 1500 m^2 CNM clean room for micro and nanofabrication (find a list of currently available equipment at https://www.imb-cnm.csic.es/en/micro-and-nanofabrication-clean-room/technology-offer) and associated labs

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(electronic circuits assembly, electronic characterization, packaging, rapid prototyping). She/he will be trained in the use of these laboratories and equipment as needed for the development of the proposed research, e.g. in radiation detector design, fabrication, and characterization as well as in the basic principles of medical physics.

Candidate Profile:

We are looking for a motivated researcher with:

- PhD in Micro and Nano technology, Physics, Electronics, or related field.
- Previous experience in micro-nanofabrication, radiation detectors, and medical physics will be positively valued.

Interested candidates, please send a short CV (max. 5 pages) and a letter of motivation (max 1 page) to consuelo.guardiola@imb-cnm.csic.es and gemma.rius@imb-cnm.csic.es

The deadline for receiving your expression of interest is 15th June 2023. Please visit the MSCA Postdoctoral Fellowship webpage for more details on what the funding covers and who can apply:

https://marie-sklodowska-curie-actions.ec.europa.eu/actions/postdoctoral-fellowships

More details of the call can be found on: https://www.imb-cnm.csic.es/en/about-center/careers/open-positions.