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ICCRAM
INTERNATIONAL RESEARCH CENTER IN CRMS FOR ADVANCED INDUSTRIAL TECHNOLOGIES



URGENT POSITION: ICCRAM-University of Burgos (Spain) has a PreDoc vacancy related to *large scale MD simulations of MoS₂* in the framework of H2020-MSCA-ITN-2016-SOLUTION-GA-721642

ABOUT UNIVERSITY OF BURGOS-ICCRAM:

ICCRAM (International Research Center in CRMs for Advanced Industrial Technologies), is an **International Excellence Research Center** located at the University of Burgos facilities, which is developing activities in the following areas: Biophysics, Biotechnology, Industrial Technology, Materials science, Nanosafety, Materials design, Nanotechnology, Nuclear technology, Resource management efficiency, Eco-innovation and Substitution of critical raw materials. ICCRAM is a major partner in international organizations such as EU-NANO futures or the International Nanotechnology Industries Association (NIA) with participation in [12 H2020 European projects](#) and **3 international actions** in the framework of COST, EERA, and ITER.

DESCRIPTION:

Under the framework of [H2020-MSCA-ITN-2016-SOLUTION-GA-721642](#), a **research and training program for 14 Early Stage Researchers (ESR)** pursuing their PhD in various disciplines covering the broadly defined area of **solid lubricant coatings** is provided. The research and training activities of SOLUTION will involve 14 individual research projects. An ESR will be hired for 3 (three) years by one of the host institutions and enrolled in a PhD program.

The project combines theoretical approaches represented by **advanced nanoscale simulations, laboratory design and fabrication of novel solid lubricants** supported by simulations, and the **up-scaling** of promising solutions and their **application** in selected **emerging engineering** applications. SOLUTION will link industries from various areas dealing with similar issues through intensive training and knowledge sharing. Three topics driven by industrial partners have been selected to demonstrate the added value of simultaneous development and training. The use of modern solid lubricants underlines the transformation of industry towards smart design, which is based on predictive models and cross-communication throughout the entire production chain.

Fellows supported by the project will have a unique opportunity to **gain competence** ranging from **simulation, characterization and processing**, to **industrial processes and entrepreneurship**. Highly **individualized multidisciplinary training** reflecting actual market needs, together with **scientific excellence**, will generate an **open-minded generation** able to harvest **multidisciplinary knowledge** and to successfully face challenges represented by the design of competitive solid lubricants.

In particular, one of the two individual research projects developed in ICCRAM-University of Burgos will develop advanced **MD methodologies** to study the **friction phenomena** at the



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nanoscale, in particular to understand the **mechanisms** of the **low friction exhibited** by TMD and **extract complex molecular information** about **solid lubricant tribolayer formation**. The project is linked to the **macroscopic properties** identified in industrial solid lubricants and the **atomic behaviour** predicted by ab-initio calculations.

PROFILE:

Given that the positions are funded by the European Commission on a H2020-MSCA-ITN, eligibility restrictions apply:

- **Experience:** Early-Stage Researchers (ESRs) shall, at the time of recruitment by the host organisation, be in the **first four years** (full-time equivalent research experience) **of their research careers** and **not yet have been awarded a doctoral degree**. Full-time equivalent research experience is measured from the date when a researcher obtained the degree which would formally entitle him or her to embark on a doctorate, either in the country in which the degree was obtained or in the country in which the researcher is recruited.
- **Mobility rule:** at the time of recruitment by the host organisation, **researchers must not have resided or carried out their main activity** (work, studies, etc.) **in the country of their host organisation for more than 12 months in the 3 years immediately prior to the reference date**. Compulsory national service and/or short stays such as holidays are not taken into account.
- Each ESR will be supported by the project for a **maximum of 36 months**.
- All ESRs will take part in a **secondment** to another project partner for **up to 30% of their appointment period** (see below).
- **Mobility Allowances** and **Family Allowances** (dependant on family circumstances) are payable to ESRs.
- **Secondments:** At least **two secondments of 2 months each** to the collaborating partners will be organised during the project.

Experience and interest in the following will be positively valued:

- Hold a **university Degree** on **Physics, Chemistry, Engineering** or equivalent scientific/technical disciplines with **excellent record**.
- Previous experience in research. Presentations on Congresses or publications on the field of the present vacancy.
- Experience on computational science, modelling of materials, used to work in linux/unix
- For this position it is **compulsory to** have programming skills (i.e. fortran, c, c++, python, matlab ...).
- Capacity to work as a member of a **team, flexibility**, total availability and high **motivation** to do international stays.
- High **motivation on scientific research**.



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WE OFFER:

- A **3-year EU-funded inter-disciplinary position** which is available at the **University of Burgos-ICCRAM**.
- **Salary:** 1990€ gross per month. This position is funded by a **Marie Curie Initial Training Network initiative**. An additional € 250 **family allowance** may be payable depending on circumstances.

The successful candidates will benefit from a **wide-ranging training programme** featuring local, network-wide, and external activities with many opportunities for travel to the other European partners in the network. In addition to **top-level specific scientific training** in the disciplines, techniques and topics investigated at each node, such programme will include (but is not limited to) attendance to **international schools, exchanges** and **secondments** to other nodes, specific training on transferable skills, and in particular courses on **scientific communication** (e.g. scientific writing for publications, and presentation skills) and specific training on **intellectual property rights** (IPR) protection.

HOW TO APPLY?

You can either send your **CV, academic records** and **motivation letter** to eu-projects.iccram@ubu.es.

The **deadline** to receive the applications is **15/11/2017**.



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