

The Nanoscience Cooperative Research Center, CIC nanoGUNE, located in Donostia / San Sebastian, Basque Country (Spain), is currently looking for a

**MASTER STUDENT**  
to work on  
**EC\_H2020\_COMPET\_2017\_ESC2RAD\_CIC07\_Artacho**

NanoGUNE is a research center devoted to conducting world-class nanoscience research for a competitive growth of the Basque Country. NanoGUNE is a member of the Basque Research and Technology Alliance ([BRTA](#)) and is recognized by the Spanish Research Agency as a *María de Maeztu* Unit of Excellence.

The **position** is offered in the Theory Group, led by Artacho Cortés, Emilio (e.artacho@nanogune.eu). The Theory Research Group works both in the development of simulation techniques and in their application to different problems..

The candidate will join a **research line** focusing on Computational and theoretical condensed matter physics. Complex solids and liquids, using first-principles molecular dynamics based on density-functional theory and on linear-scaling density-functional theory. Nanoscale oxide heterostructures including multiferroics, liquid water, and water/solid interfaces, and non-adiabatic processes related to radiation damage of materials.. More information can be found at <https://www.nanogune.eu/theory>.

The aim of the **project** is to - Project: CIC072018001 - Enabling Smart Computations to study space radiation effects

- Introduction: SHORT DESCRIPTION: High-energy particles from galactic cosmic rays and from solar flares damage both spaceship materials and astronauts' living tissue. Understanding how is the damage produced and how it could be mitigated is important for safe space travel. Simulation of the effect of high-energy projectiles in matter is therefore of great interest.

- Work Plan: DETAILS OF THE PROJECT: Using programs capable of describing quantum electronic processes in condensed matter, the project aims to obtain from computer simulations the effect of ion particles shooting through selected materials, both transient and long-lived damage.

DESCRIPTION OF THE GROUP: The Theory group of Nanogune has ample experience in the description of condensed matter from first-principles simulations, in general, and in the simulation of radiation damage, in particular.

TASKS: Establish and perform a series of large-scale calculations for various projectiles, on different materials targets, with varying projectile energy, impact parameter and trajectory direction. The particulars will be selected to be of relevance to space weather problems

OBJECTIVES: Understand the origins of radiation damage in selected materials (mostly solar cells and structural and shielding materials) and in basic components of biological tissue (relevant pieces of DNA in water).

WORK MATERIALS: The work is theoretical and computational, and will involve the use of supercomputers using parallel computing. The programs will be provided.

START DATE: Whatever appropriate for a TFM

END DATE: Whatever appropriate for a TFM

TIMETABLE: Flexible

TOTAL NUMBER OF HOURS: Whatever appropriate for a TFM

LANGUAGE: English.

The successful **candidate** will have a .

Additionally, the candidate should demonstrate experience in the following skills:

Although not compulsory, the following points will be considered:

- **We promote** teamwork in a diverse and inclusive environment and welcome all kinds of applicants regardless of age, disability, gender, nationality, race, religion, or sexual orientation.

The position is expected to start in 01/10/2021 and for a total length of up to 10 months (01/10/2021 - 31/07/2022) in the Theory Group. The contract will be funded by the .

Candidates should **apply** by completing the form below and attaching the following documents:

- A complete CV
- A cover letter and at least two reference letters grouped in a single PDF file

The **deadline** for applications is **30/06/2021**.

**NOTES:**

*(i) All applicants will receive an answer after the end of the selection process; but please note that due to the large number of submissions that are expected, we cannot provide individual feedback.*

*(ii) Additional information about nanoGUNE's commitment towards [HR excellence in Research and Gender Equality](#) are available on our website.*

*(iii) We encourage you to subscribe to our [HR mailing list](#) to receive information related to nanoGUNE's open positions and open calls for different training and talent attraction programs.*