

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

PRE-DOCTORAL RESEARCHER

to work on

Quantum nanoscience of Magnetic Graphene Nanostructures

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 primary objective of the Ph.D. project is to fabricate custom-crafted magnetic graphene nanostructures on metallic surfaces and to manipulate their spin quantum state through advanced single-molecule spectroscopy measurements.

This **project** involves the following activities:

- Fabricate graphene nanostructures, implementing protocols for creating tailored geometries using the on-surface synthesis technique.
- Employ state-of-the-art STM techniques to probe and characterize the electronic and magnetic properties of the fabricated graphene nanostructures at low temperatures.
- Utilize advanced single-molecule spectroscopy techniques to study and manipulate the spin quantum states of individual graphene nanostructures.
- Process and analyze the experimental data obtained from STM and single-molecule spectroscopy measurements. Extract relevant information about spin localization, coherence, and other magnetic properties.
- Develop theoretical models and simulations to interpret the experimental results and gain deeper insights into the underlying physics.

The candidate will join a **research line** focusing on molecular quantum physics in the [Nanoimaging Group](#), led by Prof. José Ignacio Pascual (ji.pascual@nanogune.eu). The goal of the group's research is to elucidate the laws of magnetism, optics, and electronics at the scale of atoms and molecules. They use low-temperature Scanning-Probe Microscopy to study the basic quantum phenomena behind the macroscopic behavior of matter and to manipulate their basic atomic components. More information can be found at <https://www.nanogune.eu/nanoimaging>.

The successful **candidate** will have a:

- Master's degree (or equivalent) in Physics, Materials Science, Nanotechnology, or a related field.
- Demonstrated background in experimental condensed matter physics, nanoscience, or a closely related discipline.
- Programming skills and experience with scientific software packages (e.g., MATLAB, Python) for data analysis and simulation.

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

- Excellent written and verbal communication skills in English.
- Ability to present research findings effectively.
- Collaborate within an international and multicultural research team.

Although not compulsory, the following points will be considered:

- Previous experience with scanning tunneling microscopy (STM), low-temperature experimental setups, or single-molecule spectroscopy will be advantageous.

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 01/10/2023 and for a total length of up to 48 months (01/10/2023 - 30/09/2027) in the Nanoimaging Group.

Candidates should **apply** by completing the form below and attaching **a single PDF file** with the following documents:

- A complete CV, including reseach experience and background
- A cover letter, clearly stateing motivation for applying
- Academic transcripts
- Contact information of at least two academic references?

The **deadline** for applications is **31/07/2023**.

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.