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

Pre-doctoral Researcher

to work on

Coherent Control of Molecular Spins on Superconducting Platforms

We offer a PhD position in *Molecular Quantum Physics*, focused on the nanoscale investigation and coherent control of spin states in magnetic molecules using a combination of low-temperature scanning tunneling microscopy (STM) and microwave spectroscopy.

The **research project** aims to explore the quantum properties of individual spins embedded in graphene-based molecular architectures assembled on engineered superconducting platforms. A central goal is to integrate Electron Spin Resonance with STM (ESR-STM) to probe spin coherence times, spin interactions, and perform basic quantum operations. This approach holds great promise for developing atomically-precise platforms for the develpment of quantum technologies.

The **PhD student** will:

- Develop and operate an ESR-STM setup under cryogenic and ultrahigh vacuum conditions.
- Grow and characterize spin-active molecular systems on superconducting materials.
- Investigate spin dynamics and electronic quantum transport at the atomic scale.
- Contribute to the design of quantum experiments and analysis of many-body quantum phenomena

Applicants are expected to have a Master's degree (or equivalent) in Physics, Materials Science, Nanotechnology, or a related field. A strong background in experimental condensed matter physics or nanoscience is essential. Programming skills (e.g., Python, MATLAB) and experience with scientific data analysis are required. Previous exposure to STM, low-temperature techniques, or spin-resolved spectroscopy will be highly valued. Excellent written and oral communication skills in English are expected.

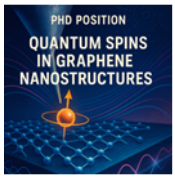
We promote teamwork in a diverse and inclusive environment and welcome all kinds of applicants regardless of age, disability, gender, nationality, race, religion, or sexual orientation.

The position is offered in the **Quantum-Probe Microscopy**, led by **Nacho Pascual** (ji.pascual@nanogune.eu), and is expected to start on 1st September, 2025. The contract will be **funded by the European Research Council grant CONSPIRA** (ERC-AdG 101097693).

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

1. A complete CV
2. A cover letter, stating research interests, and at least two reference letters

The **deadline** for applications is **31/07/2025.**



CONSPIRA ERC AdG

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.