

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 development 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**.



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.