

## Company Description

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.

## Information

 Deadline: 2024-10-04  
 Category: Academia  
 Province: Gipuzkoa  
 Country: Basque Country  
 City: Donostia-San Sebastián

## Company

CIC nanoGUNE



## Main functions, requisites & benefits

### Main functions

We offer a PhD position in Molecular Quantum Physics, oriented to the nanoscale investigation of quantum states of molecules using low-temperature scanning tunneling microscopy. The Research Project aim is to synthesize molecular nanostructures that exhibit collective electronic, optical, or magnetic quantum states. This new class of materials has a strong potential for elementary quantum operations. Therefore, the project also will develop protocols for manipulating the collective modes with electrons and photons.

This project involves the following activities: To fabricate graphene nanostructures through steered reaction on metal surfaces, implementing protocols for creating tailored geometries using the on-surface synthesis technique. To employ state-of-the-art STM techniques to probe and characterize the electronic, optical, or magnetic properties at low temperatures. To utilize advanced single-molecule spectroscopy techniques to study and manipulate their quantum states. To process and analyze the experimental data obtained from STM and single-molecule spectroscopy measurements. Extract relevant information about electronic excitations, spin localization, optical coupling, coherence, and other properties. Develop theoretical models and simulations to interpret the experimental results and gain deeper insights into the underlying physics.

The candidate will join an international and multicultural research team focusing on molecular physics, nanoscale optoelectronics, and superconductivity in low dimensions. More information can be found at: <https://www.nanogune.eu/nanoimaging>

### Requisites

The successful candidate is expected to hold a Master's Degree (or equivalent) in Physics, Materials Science, Nanotechnology, or a related field; to have demonstrated background in experimental condensed matter physics, nanoscience, or a closely related discipline, and programming skills and experience with scientific software packages (e.g., MATLAB, Python) for data analysis and simulation. Previous experience with scanning tunneling microscopy (STM), low-temperature experimental setups, or single-molecule spectroscopy will be advantageous. Additionally, the candidate should demonstrate excellent written and verbal communication skills in English, including the ability to present research findings effectively.

### Benefits

We promote teamwork in a diverse and inclusive environment and welcome all applicants regardless of age, disability, gender, nationality, race, religion, or sexual orientation. The position is expected to start on 04/10/2024 in the Quantum-Probe Microscopy Group. The contract will be funded by the Spanish Research Agency, in the framework of a Spanish collaborative research project.