PRE DOCTORAL RESEARCHER TO WORK ON QUANTUM COMPUTING WITH SPINS IN SILICON

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: 2024-10-31
Category: Academia
Province: Gipuzkoa
Country: Basque Country
City: Donostia-San Sebastián

Company

CIC nanoGUNE

Main functions, requisites & benefits

Main functions

We are pleased to offer a PhD Position in the field of silicon-based quantum computing at nanoGUNE. The project will focus on developing scalable quantum computing hardware based on silicon transistors to solve some of society's most pressing computational challenges. Silicon-based approaches to quantum information processing offer advantages for scaling such as high qubit density, record qubit coherence lifetimes for the solid state, and the ability to leverage the advanced nanofabrication methods of the semiconductor industry. Key Responsibilities: To conduct research focused on developing scalable quantum processors based on silicon spin qubits; To design scalable qubit architectures with increasingly higher qubit connectivity; To perform electrical characterization of silicon devices at millikelvin temperatures and high magnetic fields; To perform dynamical operations on spin qubits using high frequency electronic equipment; To collaborate with interdisciplinary teams, including machine learning experts, device modelling specialist, integrated circuit designers, and quantum algorithm developers; To analyze and interpret experimental data, contributing to scientific publications, patents, and presentations; To engage with the wider international research community by participating in conferences, workshops, and collaborative projects. The selected candidate will join the Quantum Technologies group lead by Prof. M. Fernando Gonzalez-Zalba, a multidisciplinary and dynamic research team passionate about building a scalable quantum computer based on silicon technology. Moreover, the PhD will have a strong industrial component given the close collaboration with the quantum computing start-up, Quantum Motion. The PhD degree will be awarded by the University of the Basque Country (UPV-EHU).

Requisites

Top tier education in Physics, Electrical Engineering, or a related field, studied to master's degree level; Background in solid-sate physics, semiconductor devices, quantum information, and/or analogue circuits is desirable; Experience in data analysis and programming, particularly in the use of Python, Git, and Gitlab; Excellent communication skills in English, both written and verbal; Ability to work independently and as part of a collaborative research team.

Benefits

A PhD stipend/salary for the duration of the project (4 years); Access to state-of-the-art cryogenic laboratory facilities and computational resources; An opportunity to spend substantial amount of time working at the Quantum Motion headquarters in London; Wider opportunities for research stays at partner academic and industrial institutions, participation in conferences, and involvement at international collaborations; Comprehensive health insurance (as per nanoGUNE and EU regulations).