

PhD Position Position for Quantum Computing Technology Group

Opening Date: 09/06/2023

Closing Date: Until filled

Job Reference: IFAE2023/10_QCT

About IFAE

The Institut de Física d'Altes Energies (IFAE) is a public consortium of Generalitat de Catalunya, the Autonomous Government of Catalonia, and Universitat Autònoma de Barcelona (UAB, a public university) whose main goal is to carry out research and to contribute to the development of high energy physics from a theoretical, experimental and technological point of view. IFAE has the status of a "University Institute" attached to UAB and its premises are within the campus of the university.

About the Quantum Computing Technology Group

The Quantum Computing Technology group develops superconducting circuits for applications mainly in quantum computation as well as quantum sensing. By employing Josephson-junction qubit technology, the group engineers superconducting circuits for a variety of applications in quantum computing, quantum optics and the interaction with high energy physics.

This position is linked to the project "Interaction of Cosmic Radiation with Qubits (ICRQ)", where novel superconducting qubit circuits are being investigated with higher resilience to environmental radioactivity and cosmic rays by mitigation of ionizing radiation in the neighbourhood of the device and by implementing on-chip mitigation strategies such as phonon and quasiparticle traps. The project will involve performing measurements at the underground laboratory of Canfranc (LSC), located in the Spanish Pyrenees. The ICRQ project is coordinated by IFAE and it involves LSC and the Institute of Microelectronics of Barcelona (IMB-CNM-CSIC) as partners.

Required skills

Candidate are expected to have:

- Master's degree (or being in the process of completing one) or equivalent in Physics in the area of quantum information science, quantum optics, or superconductivity, preferably experimental.
- Knowledge in the following topics will be highly valued: superconducting qubits, quantum information, quantum optics, superconductivity, microwave engineering, cryogenics.
- Competences: Experience in programming, particularly in python, typesetting in Latex.
- A high level of English, written and oral.

What will be your role?

The candidate will be involved in the design, fabricate and characterize superconducting qubit devices to explore the impact of ionizing radiation on its coherence properties. This will require mastering techniques in finite element solvers for circuit design, nanolithography techniques for device fabrication, the operation of low-temperature cryostats, operating qubit devices with microwave instrumentation and circuitry.

Part of the work will involve interactions with the ICRQ partners IMB-CNM-CSIC in Bellaterra for device fabrication and LSC in Canfranc for performing qubit measurements underground.

Offered contract:

A full time (40 hr/week) PhD position. The contract will have a duration of three years, with a possible extension into a fourth year.

Opportunity to gain experience learning first-hand. Personal growth, innovation, and learning every day.

The salary will be in accordance with the qualifications of the candidate.

The starting date will be as soon as possible.

Application and Selection process:

Applications should be submitted to jobs@ifae.es stating the job reference (IFAE2023/XX_QCT) as the Subject of the message. Besides a cover letter, the application should include the following documentation:

- Updated CV
- Transcript of records of Bachelor's and Master's degrees
- Letter of motivation
- 2-3 references

Sending CVs to the above address implies consent to the [IFAE's legal warning on data privacy](#).

IFAE is an equal opportunity employer committed to diversity in the workplace and social integration of people with a disability. We welcome applications from all qualified candidates. People from groups that are typically underrepresented in the labour market in general and in Science and Engineering in particular, such as women, minorities, or people with a disability, are particularly encouraged to apply.

You may contact jobs@ifae.es for any questions related to this job opening.

Deadline: until position is filled.

A Selection Committee will evaluate the received applications. If more than one candidate seems equally suitable for the position, the Selection Committee will arrange an on-line interview with each one of them as part of the Selection process.