

# PhD position in Nanostructured Superconductors for Quantum Technology

**Application closing day: 15/12/ 2025**

The PhD candidate will join the cutting-edge research activity of the group on **nanostructured superconductors** for applications in **quantum technologies** (*SuperQMat* group, <https://icmab.es/superconducting/superqmat> )

The position is in the framework of the project “High-Temperature Superconductors for Next-Gen Information & Communication Technologies (HTS-4ICT), funded by the AEI agency (Spanish Government). The project is based on the development and fundamental understanding of high-temperature superconducting (HTS) materials and nanostructures, aiming to address the energy efficiency challenges of future ICT systems. It explores the phenomenological properties of HTS systems—such as vortex dynamics, anisotropy, doping, or interface effects—to optimise their performance for quantum technologies.

## Main tasks:

The PhD candidate will be involved in the growth of HTS thin films and hybrid heterostructures, nanofabrication of superconducting architectures, and advanced physical characterisation using transport, magnetic, and structural techniques. While the primary focus is on materials science and fundamental phenomena, the work may also include preliminary steps toward integration into quantum device platforms, in collaboration with external partners.

## Key responsibilities:

Experimental work (thin film growth, nanolithography, cryogenic advanced physocal characterization) plus data analysis.

## Requirements:

- Bachelor's and Master's degrees in Physics, Materials Science, Nanotechnology, or a related field.
- Background in condensed matter physics.
- Good communication skills and fluency in English.

## Personal skills & others:

- High motivation for experimental research and team work
- Good organization, sense of responsibility, proactivity

## What it will also be valued

- Experience in experimental techniques such as thin film deposition, lithography, or cryogenics is highly desirable.
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## What We Offer:

Type of contract: FPI (Formación de Personal Investigador)

Lenght: 4 years

Salary: Gross annual salary in accordance with the call and CSIC salary policy.

Access to state-of-the-art facilities and an international, vibrant interdisciplinary research environment.

Opportunities for international collaboration and conference participation.

Integration into the doctoral programme of the Universitat Autònoma de Barcelona (UAB).

### **How to apply:**

Documents to be included: CV, a motivation letter, and contact Details of a senior researcher who could support the application references. Please send all these documents to Dr Anna Palau ( [palau@icmab.es](mailto:palau@icmab.es) )

### **What ICMAB is**

ICMAB – CSIC is a multidisciplinary global reference centre for the cutting-edge research of functional materials for electronics, energy and health which fosters knowledge transfer and it is characterized by its internationalization and its education, inclusion and diversity policies. ICMAB-CSIC is committed to know-how transfer to productive sectors as well as to participate in educational and outreach activities. Since 2016, ICMAB -CSIC has been awarded for three consecutive periods with the Severo Ochoa Centre of Excellence distinction.

ICMAB-CSIC, with over 250 members from 47 nationalities, is a more than three decades old research institute located at the Universitat Autònoma de Barcelona (UAB) campus, surrounded by other research and technological centres and with access to many state-of-the art equipment and scientific facilities. Moreover, ICMAB-CSIC has its own scientific services equipped with the newest scientific instrumentation and with highly specialised technical staff available to the scientific community.

ICMAB-CSIC stands out for its great training activity at the doctoral level. Training on technical, scientific and transversal skills are offered to ICMAB-CSIC personnel. Moreover, ICMAB-CSIC has coordinated 2 Marie Skłodowska-Curie COFUND doctoral training programs on advanced functional materials: DOCFAM (2017-2022) and DOCFAM+ (2023-2028). In total, 48 doctoral students have been trained (18 at the ICMAB).