

The Nanoscience Cooperative Research Center, CIC nanoGUNE, located in Donostia / San Sebastian, Basque Country (Spain), is currently looking for a

MASTER STUDENT
to work on
MINECO_RETOS_2018_PHOTOTHERMAG_CIC01_Vavassori

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.

The **position** is offered in the Nanomagnetism Group, led by Berger, Andreas / Vavassori, Paolo (a.berger@nanogune.eu / p.vavassori@nanogune.eu). The Nanomagnetism Group is conducting basic and applied world-class research in the field of magnetism in nanoscale structures. The group staff has a long-standing expertise and proven track record in fundamental and applied aspects of nanomagnetism, magnetic materials, and magnetic characterization, especially magneto-optical methods..

The candidate will join a **research line** focusing on the material growth and nanofabrication, non-magnetic characterization and magnetic characterization. More information can be found at <https://www.nanogune.eu/nanomagnetism>.

The aim of the **project** is to - Project: CIC012018003 - Nanomagnet logic via photothermal excitation of nanomagnetic networks - PHOTOTHERMAG

- Work Plan: The goal of this Master project is to create high-quality magnetic films, that exhibit a nanometer scale depth dependence of their composition and thus a depth dependence of their magnetic properties, such as exchange coupling constants or magneto-crystalline anisotropy. Such film structures exhibit non-uniform magnetization states by design, which can lead to relevant modifications of magnetic phase transitions, a topic that this work intends to explore. Correspondingly, the main goals of this work are to

- (i) study and identify suitable fabrication conditions for such thin films
- (ii) fabricate high-quality magnetic films with designed non-uniform depth profiles
- (iii) characterize their magnetic behavior, in particular their phase transitions
- (iv) analyze how non-uniform designs impact magnetic phase transitions

These goals are not only of substantial scientific, but also of technological interest because key data storage technologies are based on magnetic films with non-trivial depth structures, and associated device operations typically include phase transitions. Modern fabrication techniques, such as the Ultra High Vacuum Sputter system at CIC nanoGUNE, allow for the precise fabrication of such films, in which different ferromagnetic layers can be deposited and manipulated with sub-nm precision.

In the first part of the Master project different ferromagnetic alloy films will be fabricated. Subsequently, their magnetic properties and states will be measured and classified by using a superconducting quantum interference device (SQUID). The project will involve the fabrication and characterization of samples as well as the analysis of experimental results. Some prior knowledge of solid-state physics and ferromagnetism will be beneficial but is not a prerequisite..

The successful **candidate** will have a .

Additionally, the candidate should demonstrate experience in the following skills:

Although not compulsory, the following points will be considered:

- **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 expected to start in 01/10/2021 and for a total length of up to 10 months (01/10/2021 - 31/07/2022) in the Nanomagnetism Group. The contract will be funded by the .

Candidates should **apply** by completing the form below and attaching the following documents:

- a. A complete CV
- b. A cover letter and at least two reference letters grouped in a single PDF file

The **deadline** for applications is **30/06/2021**.

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.