

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

Symmetry manipulation of exchange interactions in ultrathin magnetic films

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 **aim of the research project** is to design and fabricate nano-scale multilayer structures that allow for novel local and collective magnetic properties, while utilizing symmetry and topological material design strategies. In particular, designed structural symmetry modifications will be introduced into these materials on the nanometer length scale to change quantum mechanical exchange interactions and allow for effects that are symmetry prohibited in structurally uniform systems. Accordingly, the project also includes the structural and magnetic characterization of the associated complex quantum states and the thermodynamic properties that result from such designs.

The project will include the following **activities**:

- Fabricate high-quality single crystal magnetic multilayers with predefined depth structure using UHV evaporator and sputter deposition systems.
- Employ state-of-the-art structural and magnetic characterization methods to enable a detailed analysis of these novel multilayer materials.
- Develop novel measurement schemes and protocols to gain detailed insight into the symmetry and topology induced collective magnetic states and properties.
- Process and analyze the acquired experimental data in a comprehensive manner, extract key parameters and quantities, and identify related design and structural trends.
- Develop theoretical models and simulations to interpret the experimental results and develop a comprehensive understanding of the underlying physics.

Description of the research group:

The nano-magnetism Group at CIC nanoGUNE is conducting world-class basic and applied research in the field of magnetism in nano-scale structures. The Group's staff has longstanding expertise and proven track records in fundamental and applied aspects of nano-magnetism.

Application:

If you are a (prospective) master student and you are interested in this project, please get in touch with the scientist in charge: Andreas Berger (a.berger@nanogune.eu)

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

- a. A complete CV
- b. A cover letter

The **deadline** for applications is **13/03/2025**.

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.