Spin orbitronics is an expanding field in Condensed Matter Physics that aims to utilize different phenomena in magnetism and spintronics caused by the spin-orbit coupling. One of the most studied phenomena is the interconversion between spin currents and charge currents in novel materials and interfaces, which has a strong potential to be harnessed for energy-efficient logic and memory tasks for processing of information. In this project, we aim to explore the spin Hall effect in heavy metals, the Edelstein effect at Rashba interfaces or the spin-momentum locking at topological insulators to help implementing the recent proposal by Intel of a magneto-electric spin-orbit logic. An example can be seen in our recently joint paper: V. T. Pham et al., Nature Electron. 3, 309 (2020) [free pre-print here], Phys. Rev. B 104, 184410 (2021) and Nano Lett. 20, 9, 6815 (2020).

In this project, the Master student will be responsible for the design and the fabrication of nanodevices (thin film deposition, electron beam lithography, etching). (S)he will be also involved in the magneto-transport measurements (high magnetic fields and low temperatures), data analysis, and drafting of results.

We offer an international and competitive environment, state-of-the-art equipment (including a class 100 cleanroom for nanofabrication capabilities), and the possibility of performing research at the highest level.

Description of the research group:

The Nanodevices Group in CIC nanoGUNE is mostly interested in the electronic properties of systems in reduced dimensions. Our research program is currently articulated around different themes of research related to spintronics, multifunctional devices and advanced nanofabrication. For more information, see our website at https://www.nanogune.eu/nanodevices

Application:

If you are a master student and you are interested in this project, please get in touch with the scientist in charge: **Felix Casanova (f.casanova@nanogune.eu).**

To apply for a **master scholarship**, fill in the form below and follow the instructions and recommendations of the general call **open until 30 June 2023**.

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.