

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

PRE-DOCTORAL RESEARCHER

to work on

Orbitronics

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 **Nanodevices group**, co-led by [Prof. Luis E. Hueso](#) and [Prof. Fèlix Casanova](#), is currently composed of 30 members including senior and junior researchers. The group has extensive research facilities for fabrication and characterization of devices and several active research lines spanning from nanofabrication to 2D electronics and spin transport. **More information** can be found at <http://nanodevices.nanogune.eu>

The research topic encompasses a new direction in the field of spintronics: the generation and detection of orbital angular momentum currents, in analogy to spin transport. Phenomena that allows us to generate and detect orbital currents will be studied, such as the orbital Hall effect in light metals and the orbital Rashba-Edelstein effect at interfaces, as well as the interconversion between orbital and spin currents in materials with spin-orbit coupling. The project foresees the integration of working systems into functional nanodevices.

The **research** to be performed will require the the nanofabrication of devices (thin film deposition, electron-beam lithography, etching) in cleanroom, materials characterization, and magnetotransport measurements (high magnetic fields and low temperatures).

The following is a selection of publications related to our team's recent work on this research topic:

- M. Aguilar-Pujol et al., arXiv:2506.06546 (2025);
- D.C. Vaz et al., Nature Communications 15, 1902(2024);
- V. T. Pham et al., Nature Electronics 3,309–315 (2020).

The **candidate** must have a M.Sc. in Physics, Materials Science or similar field. Proficiency in spoken and written English is also required.

Although not compulsory, the following points will be considered:

- Experience in any of these experimental techniques: e-beam lithography, materials growth and characterization, etching, electrical transport measurements
- Previous knowledge in spintronics
- Publication track record
- Self-motivated and a team player willing to coordinate the research in a particular topic

We offer an international and competitive environment, state-of-the-art equipment, and the possibility to perform research at the highest level.

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 on **1 December 2025** and for a total length of up to 4 years in the [Nanodevices group](#).

The candidates should **apply** by completing the **form below**, attaching a complete CV.

The **deadline** for application is **September 30, 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.