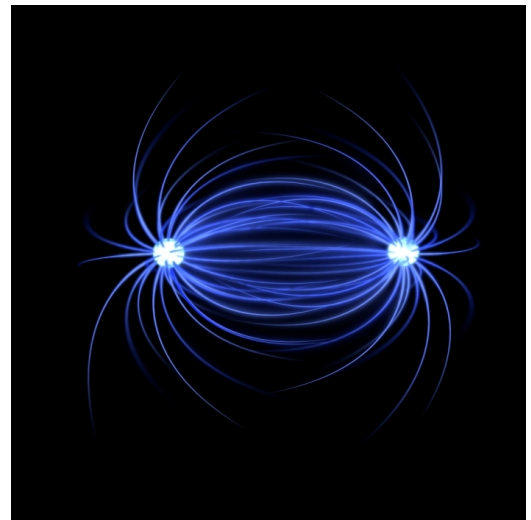




New Developments in Non-linear Transport and Magnetism (NLTM)



26.May - 29.May 2026

Cod. Z53-26

Mod.:

Face-to-face

Edition

2026

Activity type

Workshop

Date

26.May - 29.May 2026

Location

Materials Physics Center (CSIC-UPV/EHU)

Languages

English

Academic Validity

40 hours

Web

<https://nltm.dipc.org/>

Organising Committee



Description

Non-linear electron transport phenomena in solids, which occur when inversion symmetry is absent, have been widely studied in quantum materials both as fundamental properties associated to wavefunction Berry phases and for device applications in current rectification and frequency doubling. While the breaking of inversion symmetry is usually due to the crystal structure itself, in recent years it has been appreciated that certain types of magnetic order also break inversion symmetry and give rise to new non-linear effects which are magnetically switchable.

In this workshop, leading experts in non-linear transport will be able to share the latest developments in this field. These will include transport effects like DC non-linear longitudinal and Hall effects, as well as optical effects like shift and injection photocurrents and second harmonic generation. The workshop will cover different experimental techniques and a wide range of magnetic, non-centrosymmetric systems, and will have a strong focus on experiment-theory crosstalk and the connection with quantum geometric and topological aspects of such effects.

ORGANIZING COMMITTEE:

- Fernando de Juan Sanz (DIPC)
- Adolfo González Grushin (DIPC)

Objectives

We aim to foster new collaborations by creating a forum for discussion of emerging materials, mechanisms, and device-relevant non-linear phenomena.

We also aim to highlight the latest research in the field, bringing novel experiments from different perspectives under a common thread.

Finally, we hope to identify open challenges and future research directions in magnetically switchable non-linear effects and their potential technological applications, and to strengthen the conceptual framework linking symmetry breaking, Berry-phase physics, and non-linear responses in condensed matter systems.

Course specific contributors



Directed by



Fernando de Juan Sanz

Donostia International Physics Center

Teachers



Junyeong Ahn

The University of Texas at Austin



Reyes Calvo

CICNanogune



Chiara Ciccarelli

University of Cambridge



Ion Errea

University of the Basque Country

Ion Errea is an Associate Professor at the University of the Basque Country and leads the Quantum Theory of Materials group at the Centro de Física de Materiales. His research focusses on the development of theoretical methods for calculating complex properties of solids, such as quantum and

anharmonic effects in atomic vibrations and the electron-phonon interaction, and the application of these methods in hydrogen-based superconductors, thermoelectric materials, phase transitions in solids, nanostructures, etc. He is an ERC grantee, research associate at the Donostia International Physics Center, and member of Jakiunde.



Chunyu Guo

Dr.



Tobias Holder

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Toshiya Ideue

The Univerisity of Tokyo



Roshan Krishna Kumar Kumar

Catalan Institute of Nanosciences and Nanotechnology



Qiong Ma Ma

Boston College

Dr. Qiong Ma got her Bachelor's degree from the University of Science and Technology of China (USTC). She then moved to MIT where she got her Ph.D. of physics under the supervision of Prof. Pablo Jarillo-Herrero and in close collaboration with Prof. Nuh Gedik. Her group focuses on uncovering and understanding the fundamental physics of novel quantum materials, particularly about electron and phonon dynamics, low dimensionality, topology, and correlation. Our group applies advanced nano-/micro-sized device fabrications to control multiple degrees of freedom in quantum materials and combine low-temperature electronic transport and nonlinear, ultrafast, and near-field optoelectronic microscopies and spectroscopies to probe the physics.



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Registration fees

REGISTRATION FEES

UNTIL 17-05-2026

Fee Waiver

0 EUR

Regular Attendant

200,00 EUR

Place

Materials Physics Center (CSIC-UPV/EHU)

Manuel de Lardizabal, 4. 20018 Donostia / San Sebastián

Gipuzkoa