



CMD2020GEFES mini-colloquium

Magnetism and Correlations in 2D Materials in and out of Equilibrium

José J. Baldoví, Michael A. Sentef, Juan José Palacios

The recent discoveries of magnetism, superconductivity and correlated insulating states in 2D materials has spurred gigantic interest in the condensed matter community. Conversely, time-resolved spectroscopies have by now advanced to the point where ultrafast measurements and control of 2D materials properties are within reach. In this mini-colloquium, we will bring together a new generation of scientists bridging the two fields -2D materials and ultrafast phenomena- in order to highlight the fantastic potential that emanates from the combination of both research fields.

We will start with an invited overview talk on prospects of 2D materials, followed by invited talks on the light induced anomalous Hall effect in graphene measured by a cutting-edge ultrafast transport technique; on correlated states in Moiré systems investigated by scanning tunneling spectroscopy and theory; and on time-resolved band structures and dynamical correlations in 2D materials. These longer talks presenting recent research highlights, which have been published in high-profile journals, will be complemented by contributed talks and posters. This mini-colloquium is of interest for scientists working on 2D magnetism and quantum anomalous Hall effects, Floquet-engineered topological phases and non-equilibrium dynamics in atomically-thin materials, as well as correlated insulators and superconductors.

Everyone is aware of 2D magnetism and correlated 2D materials. Not everyone is aware of recent progress in ultrafast dynamics of correlations. The latter harbors such great potential (e.g., ultrafast memory devices, programmable quantum gates for quantum computing) that it would be a waste not to connect these fields and encourage especially PhD students to join the fun.

Invited speakers:

Dr. Efrén Navarro-Moratalla, Massachusetts Institute of Technology (USA)

Prof. James McIver, Columbia Univ. & MPSD Hamburg (USA)

Prof. Dante Kennes, RWTH Aachen (Germany)

Dr. Ralph Ernstorfer, FHI Berlin (Germany)