Transformations of Correlated Electronic States by Electric or Optical Impacts.

International research school and workshop

IMPACT - 2024

https://www.lptms.universite-paris-saclay.fr/impact2024/

August 19-31, 2024

Cargèse, Corsica, France

Organizers:

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CNRS & University Paris Saclay, France

A high activity in solid state physics is guided by goals of controlled transformations of electronic cooperative states by strong external impacts. The relatively new principle directions include the dense electronic excitations by very fast strong optical pulses and manipulating the concentration of electrons by strong electric fields from the electrostatic doping, hetero-structures, in situ STM, or by tera-Hz pulses. Effects of high magnetic fields and stresses are also on agenda with particular realizations in mono- or weakly couples layers. The latest trend is to employ these means in combination.

With such a vast agenda, it is particularly important to reach a synergy and cross-fertilization between the branches of this diverse and still young science which still lack an acquaintance - particularly with respect to the major techniques and different classes of materials. That is the purpose of our series of conferences and research schools IMPACT, which have been organized since 2012.

This announcement calls for participating in the next event IMPACT-2024 which will take place on August 19-31, 2024 at the Cargèse institute in Corsica, France. The structure of the meeting will integrate organically daily lectures, review seminars, sessions of oral and poster presentations, and discussions slots.

The program will unify the following subjects.

EFFECTS OF MAJOR INTEREST

- Impact switching of the superconducting state.
- Impact switching of magnetically ordered states.
- Impacts upon phases of electronic crystals: Charge/Spin density waves, Wigner and polaronic crystals, charge ordering and electronic ferroelectricity.
- Mott, Peierls and excitonic insulators.
- Electronic systems at surfaces and interfaces.
- Topological defects in inhomogeneous and instantaneous cooperative electronic phases.
- Dynamics of symmetry breaking.
- Time evolution of electronic spectra.
- Time evolution of lattice and collective modes.
- Magic angle strains.

METHODS

- Electrostatic doping and field effect.
- Electrolytic and ferroelectric manipulations.
- Effects of high magnetic fields.
- Stresses from pressure, shear and encapsulation.
- MBE fabrication of active interfaces.
- FIB design.
- Femtosecond optical pump-and-probe.
- Tera-Hz pulses.
- Combined methods: the light and the field.
- STM studies and manipulations.
- Time resolved ARPES probes.
- Time resolved X-ray diffraction.
- Microscopic and phenomenological theories.

MATERIALS OF INTEREST

cuprates, oxides, halcogenides, electronic ferroelectrics, Van der Waals crystals, graphene, mono- and few-layered structures.

The major expected features of IMPACT-2024 can be appreciated by visiting sites of earlier events:
http://lptms.u-psud.fr/impact2016/
http:// lptms.u-psud.fr/impact2012/

Fees waiving is previewed for Masters and PhD students.

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