ÉCOLE DE
PHYSIQUE DES HOUCHES

Emergent Electronic States Confined at Interfaces

Session CXV
July 6- 24, 2020

Organizers: **Marc Gabay** (Université Paris-Sud, Paris-Saclay, France)
Masashi Kawasaki (The University of Tokyo, Japan)
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Overview: Transition metal oxide surfaces and interfaces, twisted bilayer graphene and dichalcogenide bilayers host emergent electronic states arising from an interplay of crystal structure, kinetics, Coulomb interactions, orbital specialization and spin-orbit contributions. These confined systems can be driven across insulator to metal or to superconductor transitions, and in some cases large magneto-resistive or spin fluctuation regimes. Topological properties are also expected for several materials. The scope of the school is to present the theoretical approaches and experimental tools allowing us to capture the physics at play for these emergent states. Spintronics and oxide electronics applications will also be discussed.

Website: http://physinfo.fr/houches2020

Lecture courses:

G. Aeppli (Züric, Lausanne and PSI	Spectroscopic probes of emergent materials
A.Georges (Paris and CCQ	Theoretical modeling of correlated materials
L. Balents (Santa Barbara)	Superconductivity and topology
M. Bibes (Palaiseau)	Spintronics advances in oxide materials
R. Claessen (Würzburg)	Photoemission approaches of correlated materials
P. Ghosez (Liège)	From first principles to Landau-Ginzburg approaches for oxides
H. Hosono (Yokohama)	Electrides: materials, electronic structure and properties
H. Hwang (Stanford)	Probing electronic transport of oxide membranes and interfaces
P. Jarillo-Herrero (Cambridge, USA)	Electronic states of twisted bilayer graphene and dichalcogenides
R. Lobo (Paris)	Optical spectroscopy of confined electronic states
A. MacDonald (Austin)	From spin-orbit physics to Moiré-superlattices in the 2D limit
D. Schlom (Cornell)	Engineering oxide interfaces and heterostructures utilizing epitaxy
H. Takagi (Stuttgart)	Quantum spin-liquids
A. Yazdani (Princeton)	Local electronic probes of emergent correlated states

Colloquia speaker list: TBA

Registration: The online application can be found on https://houches.univ-grenoble-alpes.fr/. Applications must reach the School before March 2, 2020, in order to be considered by the selection committee. The full cost per participant, including housing, meals and the book of lecture notes is listed on the website. We should be able to provide financial aid to a limited number of students. Further information can be found on the website. One can also contact the School at:

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Location: Les Houches is a village located in Chamonix valley, in the French Alps. Established in 1951, the Physics School is situated at 1150 m above sea level in natural surroundings, with breathtaking views on the Mont-Blanc mountain range, conducive to reflection and discussion.