

CONDENSED MATTER COLLOQUIUM SERIES

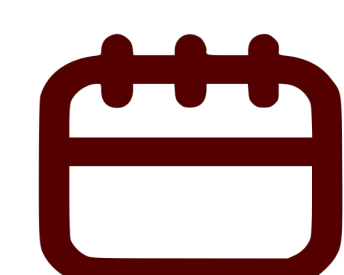
#Ankara

Urban Seifert

University of Cologne

Novel magnetic states in moiré heterostructures

In my talk, I will introduce moiré heterostructures of 2D transition metal dichalcogenide semiconductors as a new platform to study the physics of strongly-correlated electrons. I will show how experimentally observed incompressible many-body states can be understood in terms of Mott insulating states of an effective Hubbard model. These Mott insulators can occur both at half filling and at fractional fillings, in the latter case with a concomitant charge crystallisation (i.e. the formation of generalized Wigner crystals). Some of these Wigner-Mott insulators have frustrated lattice geometries, implying that magnetic exchange interactions might stabilize unconventional antiferromagnetic orders -- most notably, long sought-after quantum spin liquids which are highly entangled states of spins described in terms of deconfined phases of emergent gauge theories. Thus, moiré TMD heterostructure may be a fruitful novel platform for studying exotic phases of quantum magnets.

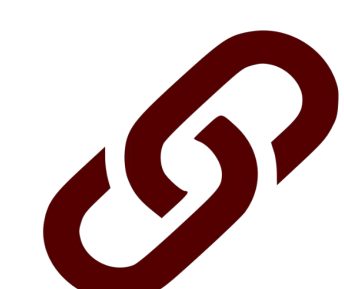


Nov, 25, 2025

Tuesday



19:00, (Ankara Time)



Click [here](#) for zoom link

Meeting ID: 432 931 6595

Password: 326852

Dr. Urban Seifert leads an Emmy Noether research group at the Institute for Theoretical Physics, University of Cologne, where he studies emergent collective behavior in interacting quantum many-body systems. His research spans frustrated magnetism, spin liquids, moiré materials, and driven non-equilibrium dynamics.

For more information visit

acmc.bilkent.edu.tr

If you have any queries, please contact okte@fen.bilkent.edu.tr

If you'd like to sign up to the mailing list to receive announcements and remainder, please use:

<https://forms.gle/dQM6CPgAXiaqLqBD6>