INSIGHT SEMINAR | Unconventional Magnetism and Pairing in Two-Dimensional Materials: From Moire Materials to Synthetic Quantum Matter

IVAN MORERA NAVARRO

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12:00 to 13:00
Elements Room

ABSTRACT

Recent advances in the fabrication of engineered quantum materials, together with the emergence of programmable quantum simulators, have enabled the controlled exploration of quantum phases of matter dominated by strong many-body correlations. Prominent examples include bilayer structures of two-dimensional van der Waals materials, ultracold atoms in optical lattices, and Rydberg tweezer arrays. These platforms have recently provided new insights into the emergence of unconventional phases upon doping strongly

correlated magnetic insulators and hold strong potential for probing unconventional superconductivity mediated by magnetic fluctuations.
In this talk, I will review recent progress toward understanding the emergence of unconventional magnetism and pairing upon doping correlated insulators. I will discuss recent experiments on these platforms and highlight how novel spectroscopic techniques have been implemented, leading to a deeper understanding of unconventional quantum phases.

BIO

Ivan Morera Navarro is a Postdoctoral Fellow at the Institute for Theoretical Physics at ETH Zurich. His research focuses on condensed matter physics and quantum many-body systems, with particular emphasis on two-dimensional moire materials, quantum simulators, spectroscopic techniques, and the development of advanced numerical methods to simulate strongly correlated quantum systems.
He obtained his PhD in Theoretical Physics from the University of Barcelona in 2023. During his doctoral studies, he conducted research visits at Harvard University and ETH Zurich.
Hosted by: Prof. Dr. Leticia Tarruell