Title: Correlated quantum matter and quantum information

First Name: Laurent
Name: Sanchez-Palencia
Laboratory: CPHT

Email: lsp@cpht.polytechnique.fr

Webpage: https://www.cpht.polytechnique.fr/cpht/uquantmat/

Research Area: Quantum Science and Technology (primary), Condensed Matter Physics

Methods: Quantum field theory, quantum information approaches, quantum Monte-Carlo, tensor network approaches

PhD track subject: The group conducts theoretical research on the dynamics of correlated quantum matter, in connection with ultracold atoms, quantum optics, and quantum simulation. Our work aims at characterizing novel quantum phases of matter and quantum phase transitions, understand quantum transport as well as out-of-equilibrium dynamics in correlated quantum matter. We are also interested in the application of quantum information theory to condensed matter. To this aim, we develop both analytical and numerical approaches. The PhD track fellow will join one of the ongoing projects on either the characterization and quantum simulation of exotic quantum materials or the application of quantum information approaches to correlated quantum models. The figure below illustrates the propagation of information in a correlated quantum system with long-range interactions. For further information, check our research webpage at https://www.cpht.polytechnique.fr/cpht/uquantmat/

Recent publications of the group: