ARPES STUDIES OF ELECTRONIC FLAT BANDS IN QUANTUM MATERIALS

The focus of this postdoctoral project is the investigation of the experimental band structure of novel flat band systems. The materials to be studied span a wide variety of structures and compositions and are generally based on three dimensional crystals featuring destructive interference hopping networks or with engineered atomic-scale superlattices of structural or magnetic nature. The position is open for a candidate who is expert in synchrotron-based ARPES studies of materials with quasi-2D and 3D lattice structures, and who has good knowledge of quantum matter physics including strongly correlated electron phenomena and topological phenomena. Additional experience in as DFT-based theoretical modeling and in other experimental characterization techniques (optical spectroscopy, X-ray scattering, transport, etc.) as well is highly valued but not strictly required.

This work will be performed in close partnership and collaboration with the MIT groups of Prof. Checkelsky (materials synthesis and transport) and Prof. Fu (theoretical modeling), as part of a research team that holistically covers all aspects of this project and forms a highly interdisciplinary group.

This is a two-year position based at MIT. Travel to synchrotron facilities (primarily in the US, but also internationally when required) is expected in the amount of 3-4 beamtime experiments every year.