Quantum materials (Experimental)

(Expertise in the studies of quantum phenomena in contemporary materials (e.g. topological systems) at low temperatures, preferably using advanced techniques and large scale facilities).

Collective behaviour of electrons, quantum fluctuations, topology of electron wave functions and entanglement underlie some of the outstanding physical phenomena in quantum materials. Experimental realization of emergent quantum states with fractional excitations including monopole excitations, non-trivial topological spin textures, and skyrmions is a long-sought goal in condensed matter physics. Innovative techniques to control, tailor and manipulate exotic quasi-particles in quantum materials might lead to revolutionary quantum technologies. The current challenge is to design and grow new quantum materials that host emerging quantum phenomena and deploy an array of experimental techniques for the realization and exploration of non-trivial topological quantum states. The physics of these materials is quite rich, diverse and complex that demands several state-of-the-art experimental techniques to explore underlying mechanism driving collective quantum phenomena and to elucidate the universal principles that organize the entangled states in quantum materials. We have been deploying a set of experimental techniques to understand spectacular quantum effects in quantum materials.

We are looking for prospective candidates at the assistant professor level with expertise in setting up and performing low temperature experiments. Candidates with relevant experience in one or more of the following experimental fields: electronic and magnetic properties, neutron scattering, angle resolved photoemission spectroscopy, scanning tunnelling microscopy / spectroscopy and other advanced studies of quantum materials at low temperatures, will be preferred. We are also looking for candidates with experience in crystal growth aspects and experiments dealing with single crystals of quantum materials. The candidate is expected to demonstrate independent research capabilities in topological quantum phenomena at low temperature. The candidate is also expected to contribute and work in tandem with the existing vibrant condensed matter groups in the department. The successful candidate will have to teach undergraduate and graduate courses in the department.

Interested candidates may contact

Prof. Santhosh P N (santhosh@iitm.ac.in / santhoshpn@smail.iitm.ac.in)

Prof. Panchanana Khuntia (pkhuntia@iitm.ac.in / pkhuntia@smail.iitm.ac.in)