



## ICTS Statistical Physics and Condensed Matter Seminar (HYBRID)

**Title** : Quantum simulation using fermionic atoms in optical lattices with tunable geometry

**Speaker** : Anant Kale (Harvard University, USA)

**Date** : Tuesday, 09<sup>th</sup> January 2024

**Time** : 04:00 PM (IST)

**Abstract** : Quantum gas microscopy with fermionic atoms has proven to be a powerful experimental tool for gaining insights into the phase diagram of the Fermi-Hubbard model, relevant for studies of high-T<sub>c</sub> cuprate materials, in regimes that are challenging to approach numerically and theoretically. Even less is known about the phases of the Hubbard model beyond the usual square lattice, for e.g. in the presence of geometric frustration. In this talk, I will give an introduction to cold-atom based quantum simulation and its applications to various models of strongly correlated materials. I will also talk about our recent experimental work on observing itinerant magnetism in a triangular lattice Hubbard model in the presence of doping and geometric frustration.

Paper links:

1. <https://doi.org/10.1038/s41586-023-06280-5> (<https://arxiv.org/abs/2212.13983>)
2. <https://arxiv.org/abs/2308.12269>

**Venue** : **Offline:** Emmy Noether Seminar Room (ICTS)

**Online:** Please click on the below link to join the seminar

<https://icts-res-in.zoom.us/j/96975766147?pwd=N0VuR1QwcUpyaG1iSkJXMm4zOEQ2Zz09>

Meeting ID: 969 7576 6147

Passcode: 246445