Title: **Effect of magnetic field and disorder in unconventional superconductors**

Abstract: The presence of disorder, inherent to all real systems, makes the pure superconductors inhomogeneous. Another route to make a pure superconductor inhomogeneous is by applying an orbital magnetic field. It is well known that the magnetic field penetrates a type-II SC by generating a periodic array of Abrikosov vortices, which has a normal metallic core of size ξ, and with circulating currents around each vortex. These current rings around each vortex extend up to the scale of the penetration depth λ. On the other hand, unconventional superconductors, particularly in cuprate superconductors, “strong electronic repulsion” germinates superconductivity with a d-wave pairing symmetry and gives rise to subdominant yet competing broken-symmetry orders, such as charge modulation orders. Individual effects of disorder and orbital magnetic field on a superconductor (SC) are well established by now. Hence, it is fascinating to study how inhomogeneities arising from vortices and impurities are intertwined in the presence of strong correlations. What role do such competing orders play in shaping the physics of vortices in a strongly correlated d-wave superconductor?
We will discuss how all these intriguing effects interplay with each other.