It is well known that an external magnetic field penetrates type II superconductors in the form of quantized vortices. Recent experimental advance using silicon micro-mechanical oscillators allowed the exploration of new regimes of vortex physics in mesoscopic scales where vortex penetrations, one at a time, were observed. In this talk, I will describe numerical studies on a planar array of flux lines in the presence of quenched disorder. Novel sampling algorithms developed in the area of recreational mathematics about domino tiling and shuffling permit large-scale simulations without the need to run extremely slow relaxational dynamics. Numerical evidence for magnetic "finger prints" and universal susceptibility fluctuations, which are the hallmark of mesoscopic physics, will be presented.

REFRESHMENTS AT 3:45 P.M.