

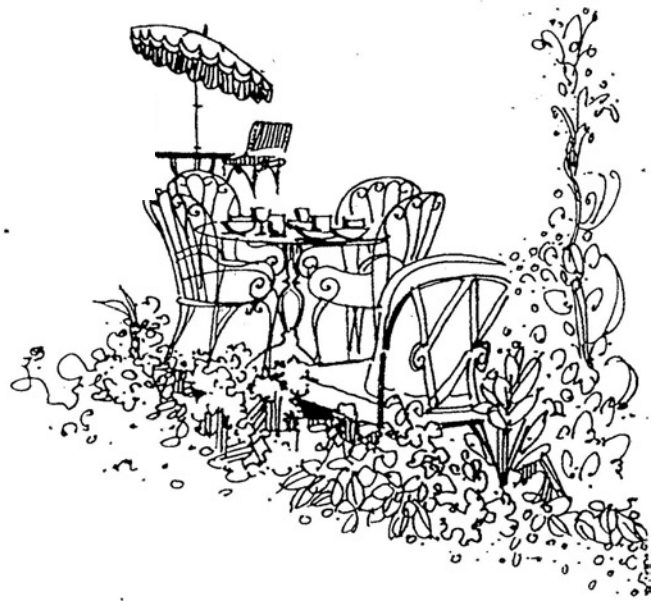
Chez Pierre

Presents ...

Monday, November 8, 2021

12:00pm Noon

Broadcast via Zoom



Chez Pierre Seminar

Anaëlle Legros— Johns Hopkins University

"Observation of cyclotron resonance and measurement of the cyclotron mass in $\text{La}_{2-x}\text{Sr}_x\text{CuO}_4$."

Recently developed time-domain terahertz spectroscopy in pulsed magnetic fields up to $\sim 30\text{T}$ [1] enables the study of cyclotron resonance in new materials, such as strongly correlated metals with relatively large effective masses. This phenomenon, identifiable as a shift in frequency of the metallic Drude peak, allows one to directly extract the cyclotron mass, scattering rate and density of charge carriers as a function of field and temperature, with less stringent requirements than quantum oscillations. Applying this technique to thin films of the cuprate LSCO, we observe a cyclotron shift in an optimally-doped sample consistent with the cyclotron motion of holes with a mass of $4.9 \pm 0.8 m_e$, and a scattering rate that increases with magnetic field [2]. This new technique could in this way allow the study of the strange metal state of cuprates and other materials by directly extracting crucial information in a wide variety of compounds.