

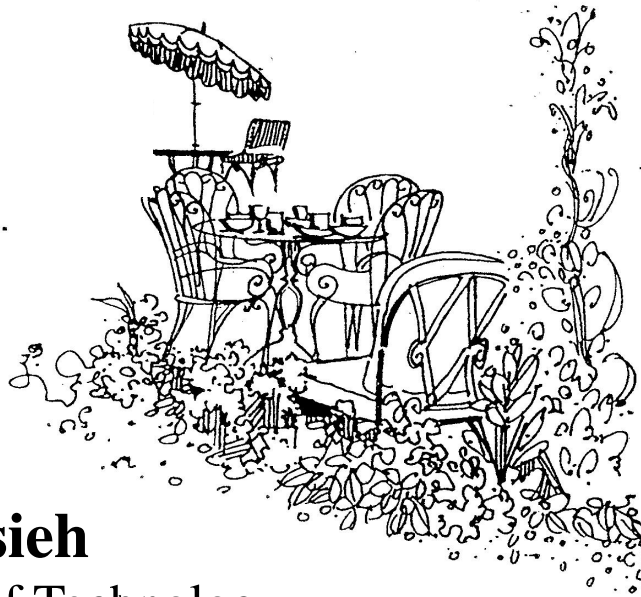
Chez Pierre

Presents ...

Monday, April 27, 2015

12:00pm

MIT Room 4-331



David Hsieh

California Institute of Technology

”Subtle structural distortions and a hidden magnetic phase in Sr_2IrO_4 revealed using nonlinear optical measurements “

Iridium oxides are predicted to host a variety of exotic electronic phases emerging from the interplay of strong electron correlations and spin-orbit coupling. There is particular interest in the perovskite iridate Sr_2IrO_4 owing to its striking structural and electronic similarities to the parent compound of high- T_c cuprates La_2CuO_4 . However, despite theoretical predictions for unconventional superconductivity and recent observations of Fermi arcs with a pseudogap behavior in doped Sr_2IrO_4 , no superconductivity has been observed in this compound so far. In this talk I will describe the nonlinear optical spectroscopy and wide field microscopy techniques that we have recently developed to resolve the symmetries of both lattice and electronic multipolar ordered phases on single domain length scales. I will show our results on both the parent and doped Mott insulator Sr_2IrO_4 that reveal a subtle structural distortion and provide evidence for a hidden loop-current ordered magnetic phase that has previously eluded other experimental probes. The significance of these novel orders to magneto-elastic coupling and the pseudogap phase in Sr_2IrO_4 will be discussed.