

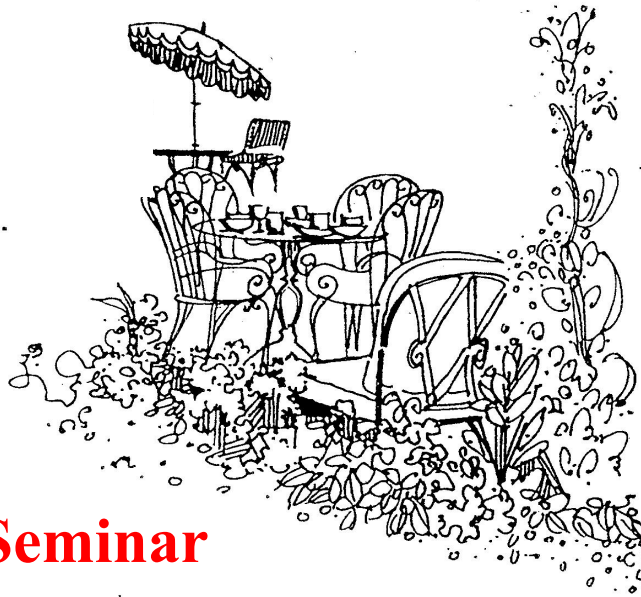
Chez Pierre

Presents ...

Monday, November 9, 2015

12:00pm

MIT Room 4-331



Chez Pierre Seminar

Senthil Todadri

Massachusetts Institute of Technology

” Half-filled Landau level and topological insulator surfaces“

I will describe recent developments relating the physics of the half-filled Landau level in two dimensions to correlated surface states of topological insulators in three dimensions (and to certain quantum spin liquid phases). The resulting insights provide an interesting answer to the old question of how particle-hole symmetry is realized in composite fermion liquids. Specifically the metallic state at filling $\nu = \frac{1}{2}$ - described originally in pioneering work by Halperin, Lee, and Read as a liquid of composite fermions - was proposed recently by Son to be described by a particle-hole symmetric effective field theory distinct from that in the prior literature. I will describe physical justifications of this proposal both through modification of older pictures of composite fermions, and through the connections to topological insulator surfaces. I revisit the phenomenology of composite fermi liquids (with or without particle-hole symmetry), and show that their heat/electrical transport dramatically violates the conventional Wiedemann-Franz law but satisfies a modified one.