

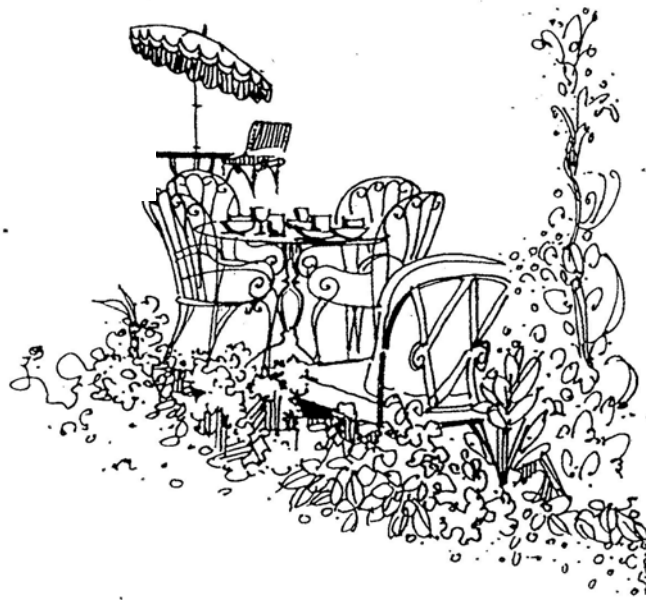
# *Chez Pierre*

Presents ...

**Monday, September 21, 2026**

**12:00pm – 1:00pm**

**Duboc room - 4-331**



## **Chez Pierre Seminar**

**Andrey Chubukov (University of Minnesota)**

### **“Limits of validity for Migdal-Eliashberg theory: role of polarons”**

It is widely believed that in the adiabatic limit the Fermi liquid state of an electron-phonon system, described by Migdal-Eliashberg theory, remains stable until a dressed phonon softens at some momentum. I report the results of analytic and numerical (variational) calculations for the prototypical Holstein model, which show that in a wide range of fillings, a polaronic state emerges before phonon softening; at small filling in 3D this happens already at weak coupling. I show that a polaronic state emerges, upon increasing coupling, via an intermediate pseudogap-type mixed state, in which some fermions retain Fermi liquid behavior, yet Luttinger theorem is violated. At even larger couplings, the density of states gradually approaches its form in the atomic limit, where it is a set of d-functions.