

# *Chez Pierre*

Presents ...

**Monday October 28, 2024**

**12:00 pm -1:00 pm**

**Duboc Room – 4-331**



## **Chez Pierre Seminar**

**Carolyn Zhang, Harvard University**

### **"Thermalization rates, Liouvillian gaps, and operator spreading".**

I will present two recent results on aspects of operator spreading in quantum many-body systems. The first result concerns the rate at which autocorrelation functions of local operators decay in thermalizing systems without conservation laws, such as Floquet and random unitary circuits. We use a simple hydrodynamical picture for operator spreading to relate this rate to properties of the unitary dynamics, and argue that this rate is encoded in the leading eigenvalue of a dynamical map obtained by enriching the unitary dynamics with weak dissipation. The second result is a generalization of Lieb-Robinson bounds that can be applied to describe the shape of operators that leak outside of the Lieb-Robinson light cone and tighten bounds related to gapped quantum phases of matter.