

# *Chez Pierre*

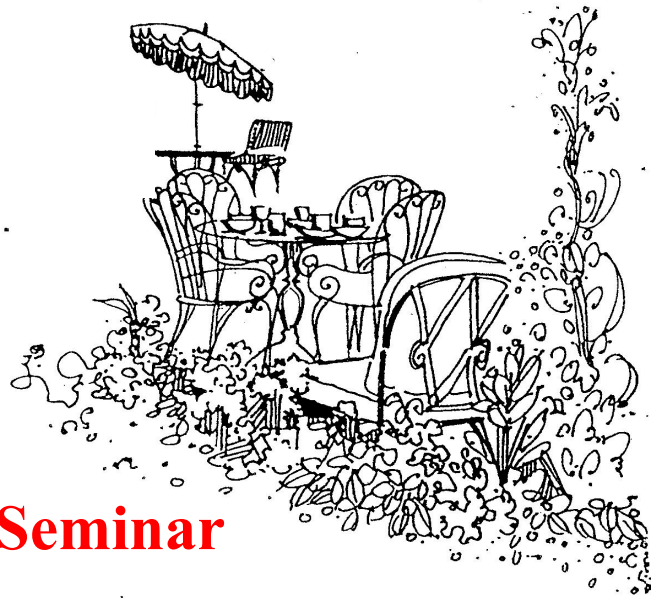
Presents ...

**Monday, October 2, 2017**

**12:00pm Noon**

**MIT Room 4-331**

## **Chez Pierre Seminar**



**Sanfeng Wu – Massachusetts Institute of Technology**

**“Topology and Correlations in Monolayer WTe<sub>2</sub>”**

Topology and correlations are two fundamental aspects that determine the electronic ground states of condensed matter systems. Both aspects individually have led to striking observations such as the quantum spin Hall insulating state and superconductivity, respectively. The combination of them can result in exotic phenomena including topological superconductivity and non-abelian anyons. In this talk I will report our recent study on monolayer tungsten ditelluride (WTe<sub>2</sub>), where we find that topology and correlations are simultaneously important in understanding its ground state properties. In the first part, I will talk about our quantum transport measurements for identifying the undoped monolayer WTe<sub>2</sub> as a two-dimensional topological insulator. Strong evidence for the quantum spin Hall effect surviving up to 100 Kelvin will be discussed. In the second part, I will report the observation of superconductivity below 1 Kelvin when the same monolayer is electrostatically doped through boron-nitride dielectric gating. These observations demonstrate that the ground state of the monolayer is remarkably gate-tunable between the two extremes of electronic transport in materials (insulator and superconductor). Our results establish monolayer WTe<sub>2</sub> as a new platform for studying rich electronic phenomena driven by topology and correlations, including Majorana states.