

# **DEPARTMENT OF PHYSICS AND ASTRONOMY**

## **CONDENSED MATTER SEMINAR**

**Friday, April 28, 2017**

**3:30 PM, Room 203 Physics**

**Refreshments 3:00 PM Room 242 Physics**



**Professor Eun-Ah Kim**  
**Cornell University**

### **Pomeranchuk instability of composite Fermi liquid, why and so what?**

Half-filled Landau levels form a zoo of strongly correlated phases. These include non-Fermi liquids (NFL), fractional quantum Hall (FQH) states, nematic phases, and FQH nematic phases. This diversity poses the question: what keeps the balance between the seemingly unrelated phases? Recent experiment by Samkhardaze et al (Nature Physics 12, 191 (2016)) observing an isotropic pressure driven transition between the fractional quantum Hall state and a nematic state heightened the need for better understanding the mechanism and role of nematic order. In this talk, I will present our new numerical evidence for Pomeranchuk instability driven by compression of quantum well width through an explicit calculation of Fermi liquid parameters. I will then discuss the role of nematic quantum critical fluctuations in mediating pairing to drive the quantum Hall phase [see Phys. Rev. B 95, 125127].