Interacting Flatland Electrons Never Stop Surprising
MANSOUR SHAYEGAN, Princeton University

I will present the highlights of several new magneto-transport experiments that probe the physics of interacting two-dimensional (2D) electrons (or holes) at high magnetic fields and low temperatures. These include: (1) observation of rare fractional quantum Hall states at even-denominator (1/2) filling factor in 2D hole systems at an unusual crossing of the two lowest Landau levels [1,2]; (2) tuning and measuring the shape and anisotropy of the composite fermion (CF) Fermi contours [3-5], and (3) data suggesting that CFs themselves can be interacting and form their own fractional quantum Hall and Wigner solid states [6]. I will also discuss a bilayer experiment where the CFs in one layer are used to probe an electron Wigner solid in the other layer [7].

(Work done in collaboration with Yang Liu, D. Kamburov, M.A. Mueed, S. Hasdemir, I. Jo, H. Deng, L.N. Pfeiffer, K.W. West, and K.W. Baldwin. Supported by the NSF, DOE, Keck, and Moore Foundations.)