

Physics Colloquium

Monday, December 2, 2019 / Pupin Hall Theory Center, 8th Floor / 12:30 PM

Lunch will be available for attendees

"The Metal-Insulator Transition (MIT) in Two Dimensions: Yet Another Surprise.*"

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According to theory and confirmed by experiment, no metallic phase was thought to be possible in two dimensions. It was therefore a big surprise when an apparent metal-insulator transition was reported in 1994 in the strongly interacting 2D electron system in high mobility silicon MOSFETs (Metal Oxide Semiconductor Field Effect Transistors) [1]. A great deal of theoretical and experimental activity ensued to determine whether this is a transition rather than crossover behavior, and to determine the nature of the transition. Most (but not all) experiments (including our own) have claimed to show that this is a *quantum* phase transition that occurs at a finite electron density n_c in the limit $T \rightarrow 0$. In this talk, I will present new data that holds yet another surprise [2].

[1] S. V. Kravchenko, G. V. Kravchenko, J. E. Furneaux, V. M. Pudalov, and M. D'lorio, Phys. Rev. B 50, 8039 (1994).

[2] Shiqi Li, Qing Zhang, Pouyan Ghaemi and M. P. Sarachik, Phys. Rev. B 99, 155302 (2019).