

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 in 1994 when an apparent metal-insulator transition was reported 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 have claimed to show that this is a *quantum* phase transition that occurs in the limit $T \rightarrow 0$ at finite electron density n_c . In this talk, I will present new data that holds yet another surprise [2].

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

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

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