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Metal-Insulator transition in 2D: Non-perturbative results ALEXANDER PUNNOOSE, Bell Labs, Lucent Technologies, Murray Hill, NJ 07974, ALEXANDER FINKELSTEIN, Physics Dept., Weizmann Institute of Science, Rehovot, Israel 76100 — In recent years, systematic experimental studies of dilute two dimensional electron systems have revived the fundamental question: can a metal-insulator transition occur in two dimensions? We demonstrate how the metal-insulator transition may occur in a very low density system with strong electron-electron interactions. Renormalization group equations beyond the lowest order in the disorder have been obtained using a controlled large-N approximation scheme. Our results indicate that the interacting electron gas undergoes a metal to insulator transition when the disorder is increased.

Alexander Punnoose
Bell Labs, Lucent Technologies, Murray Hill, NJ 07974

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