

Abstract Submitted
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Stability of two dimensional disordered metals¹ PALLAB GOSWAMI, University of Maryland, College Park, HART GOLDMAN, University of Illinois at Urbana-Champaign, SRINIVAS RAGHU, Stanford University — Metallic phases have been observed in several disordered two dimensional systems, including thin films near a superconductor-insulator transition, and quantum Hall systems near plateau transitions. If metallic ground states do exist in such systems, they can only do so due to electron-electron interactions. Motivated by these phenomena, we consider general circumstances under which two dimensional electron systems in the presence of both interactions and disorder may exhibit metallic ground states. We formulate a general stability criterion for a large class of non-Fermi liquid ground states against disorder. As an explicit example, we consider (2+1)-dimensional quantum electrodynamics with a large even number of fermion flavors in the presence of disorder. We show the existence of a stable metallic or non-Fermi liquid phase and its quantum phase transition to a disorder dominated phase.

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