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Pseudogap in strongly interacting and strongly disordered systems SIMONE CHIESA, PRABUDDHA CHAKRABORTY, WARREN PICKETT, RICHARD SCALETTAR, UC Davis — The interplay of disorder and correlation is known to give rise to anomalies in the density of states at the chemical potential of quantum and classical systems. In particular, in the quantum case, the diagrammatic calculation of Altshuler and Aronov predicts a pseudo-gap for the case of a weakly disordered and weakly interacting metal. Here we report a numerical study suggesting that such anomalies are present also in the case of strongly interacting and strongly disordered systems. We consider the Hubbard model in the presence of diagonal disorder and diagonalize small clusters (up to 12 sites) in the framework of a grand canonical scheme involving twisting the boundary condition. For a given interaction and disorder strength we observe the formation of a pseudo-gap whose shape and depth is largely insensitive to the particle density. For a given particle density the pseudo-gap gets deeper as the interaction and the disorder are increased.

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