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**Effect of nonlocal interactions on the disorder-induced zero-bias anomaly in the extended Anderson-Hubbard model**[1] RACHEL WORTIS, HONGYI CHEN, W.A. ATKINSON, Trent University — Adding disorder to a system of correlated electrons moves single-particle states away from the Fermi surface. In the weakly correlated regime, consensus exists on the evolution of the resulting density of states anomaly between the limits of weak and strong disorder. Recently a number of groups have made progress in understanding the strongly correlated regime, mostly in the context of purely local interactions. We study the extended Anderson-Hubbard model using exact diagonalization on two-dimensional 12-site clusters, exploring the evolution of the zero-bias anomaly with the strength of the nonlocal interaction and with doping. At half filling, an exchange-driven Altshuler-Aronov-like anomaly develops Efros-Shklovskii-like atomic character and moves to a regime of strong charge-density correlations, whereas at quarter filling both the Efros-Shklovskii-like behavior and the charge density correlations are much weaker.

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Rachel Wortis
Trent University

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