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**Quantum chaos on a critical Fermi surface** AAVISHKAR PATEL, SUBIR SACHDEV, Harvard Univ — We compute parameters characterizing many-body quantum chaos for a critical Fermi surface without quasiparticle excitations. We examine a theory of $N$ species of fermions at non-zero density coupled to a $U(1)$ gauge field in two spatial dimensions, and determine the Lyapunov rate and the butterfly velocity in an extended random-phase approximation. The thermal diffusivity is found to be universally related to these chaos parameters i.e. the relationship is independent of $N$, the gauge coupling constant, the Fermi velocity, the Fermi surface curvature, and high energy details.

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