

SES09-2009-000011

Abstract for an Invited Paper
for the SES09 Meeting of
the American Physical Society

Massive Dirac fermions in single-layer graphene¹

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Motivated by the results of recent photoemission and tunneling studies, we discuss potential many-body sources of a finite gap in the Dirac fermion spectrum of graphene. Specifically, we focus on the putative Peierls- and Cooper-like pairing instabilities which can be driven by sufficiently strong Coulomb and electron-phonon interactions, respectively. Our results compare favorably with the available experimental and Monte Carlo data.

¹The author acknowledges support from NSF.