Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Strongly-correlated electrons on the 1/5-depleted square lattice Hubbard model EHSAN KHATAMI, San Jose State University, RAJIV. R. P. SINGH, WARREN E. PICKETT, RICHARD T. SCALETTAR, University of California, Davis — We study the single-orbital Hubbard model on the 1/5-depleted square lattice geometry, which arises in the spin-gap magnetic insulator CaV_4O_9 and ordered-vacancy iron selenides, presenting new issues regarding the origin of both magnetic ordering and superconductivity in these materials. We find a rich phase diagram that includes a plaquette singlet phase, a dimer singlet phase, a Neel and a block-spin antiferromagnetic phase, and stripe phases. Quantum Monte Carlo simulations show that, interestingly, the dominant pairing correlations at half filling change character from d-wave in the plaquette phase to extended s-wave upon transition to the Neel phase. These results have intriguing connections to properties of iron-based superconductors. E. Khatami, R. R. P. Singh, W. E. Pickett, and R. T. Scalettar, Phys. Rev. Lett. 113, 106402 (2014)

Ehsan Khatami
San Jose State University

Date submitted: 14 Nov 2014 Electronic form version 1.4