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**Ground-state properties of spin-imbalanced fermions on square lattices** SIMONE CHIESA, JIE XU, SHIWEI ZHANG, College of William and Mary — Atoms in optical lattices offer the opportunity to probe exotic pairing states experimentally. We consider spin-imbalanced fermions on a square lattice. Using Bogoliubov-de Gennes theory and fully self-consistent numerical calculations reaching the thermodynamic limit, we make several predictions of the physics of the ground state and the Fulde-Ferrell-Larkin-Ovchinnikov (FFLO) order. We show, in particular, that the experimentally accessible momentum distribution can be used to identify the hidden Fermi surface of the condensate and the presence of Fermi arcs. There exists a regime of density (away from half-filling) and interactions where the system can support a supersolid order. Finally, we address the crystallography of the inhomogeneous state by determining the leading wave vector as a function of U, density and polarization.

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