

Abstract Submitted
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Frustrated Cooper pairing and the f-wave supersolidity HSIANG-HSUAN HUNG, WEI-CHENG LEE, CONGJUN WU, Department of Physics, University of California, San Diego, CA 92093, DEPARTMENT OF PHYSICS, UNIVERSITY OF CALIFORNIA, SAN DIEGO, CA 92093 TEAM — Geometric frustration in quantum magnetism refers to that magnetic interactions on different bonds cannot be simultaneously minimized. The usual Cooper pairing systems favor the uniform distribution of the pairing phase among lattice sites without frustration. In contrast, we propose “frustrated Cooper pairing” in non-bipartite lattices which leads to frustrated supersolid states with non-uniform distributions of the Cooper pair phase and density. This exotic pairing state naturally occurs in the p-orbital band in optical lattices with ultra-cold spinless fermions. In the triangular lattice, it exhibits an unconventional supersolid state with the f-wave symmetry.

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