

Abstract Submitted
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From the Cooper problem to canted supersolids in Bose-Fermi mixtures LODE POLLET, Department of Physics, LMU Munich, Germany, PETER ANDERS, Theoretische Physik, ETH Zurich, Switzerland, PHILIPP WERNER, Department of Physics, University of Fribourg, Switzerland, MATTHIAS TROYER, MANFRED SIGRIST, Theoretische Physik, ETH Zurich, Switzerland — We calculate the phase diagram of the Bose-Fermi Hubbard model on the $3d$ cubic lattice at fermionic half filling and bosonic unit filling by means of single-site dynamical mean-field theory (DMFT). For fast bosons, this is equivalent to the Cooper problem in which the bosons can induce s -wave pairing between the fermions. We also find miscible superfluid and canted supersolid phases depending on the interspecies coupling strength. In contrast, slow bosons favor fermionic charge density wave structures for attractive fermionic interactions. These competing instabilities lead to a rich phase diagram within reach of cold gas experiments.

Lode Pollet
Department of Physics, LMU Munich, Germany

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