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Quartetting and pairing instabilities in one dimensional spin 3/2 fermionic systems CONGJUN WU, Kavli Institute for Theoretical Physics, UCSB
— Novel competing orders are found in spin 3/2 cold atomic systems in one-dimensional optical traps and lattices. In particular, the quartetting phase, a four-fermion counterpart of Cooper pairing, exists in a large portion of the phase diagram. The transition between the quartetting and singlet Cooper pairing phases is controlled by an Ising symmetry breaking in one of the spin channels. The singlet Cooper pairing phase also survives in the purely repulsive interaction regime. In addition, various charge and bond ordered phases are identified at commensurate fillings in lattice systems.

Congjun Wu
Kavli Institute for Theoretical Physics, UCSB

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