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Quantum phases of the one-dimensional extended Bose-Hubbard model with spin-orbit coupling[1] DAVID FEDER, University of Calgary, FAROKH MIVEHVAR, Universität Innsbruck — Quantum phases of the one-dimensional two-component Bose-Hubbard model with local and nearest-neighbor interactions, spin-orbit coupling, and a transverse magnetic field are explored within a zero-temperature mean-field theory. The interplay of kinetic and interaction energies yields Mott insulator, density wave, superfluid, and supersolid phases for either spin component. With nearest-neighbor interactions one obtains states that are supersolid in one spin component but insulating in the other. Spin-orbit and spin-polarizing terms yield a supersolid phase with antiferromagnetic spin order coupled to a density wave. The results indicate that spin-orbit interactions can drive two-component lattice gases into novel quantum phases.

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