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Title: Can fermion-boson stars reconcile multi-messenger observations of compact stars?

**Abstract:** Mixed fermion-boson stars are stable, horizonless, everywhere regular solutions of the coupled Einstein-(complex, massive) Klein-Gordon-Euler system. While isolated neutron stars and boson stars are uniquely determined by their central energy density, mixed configurations conform an extended parameter space that depends on the combination of the number of fermions and (ultralight) bosons. The wider possibilities offered by fermion-boson stars could help explain the tension in the measurements of neutron star masses and radii reported in recent multimessenger observations and nuclear-physics experiments. We construct equilibrium configurations of mixed fermion-boson stars with realistic equations of state for the fermionic component and different percentages of bosonic matter. We show that our solutions are in excellent agreement with multimessenger data, including gravitational-wave events GW170817 and GW190814 and X-ray pulsars PSR J0030+0451 and PSR J0740+6620, as well as with nuclear physics constraints from the PREX-2 experiment.