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Title: Semiclassical relativistic stars

Abstract: Quantum vacuum polarization violates energy conditions in the spacetime external to a compact star. As such an object is made to approach the black hole limit, semiclassical corrections become capable of producing new equilibrium end-states in stellar evolution. The semiclassical contribution is modeled by a massless quantum scalar field in the Boulware vacuum state, and its renormalized stress-energy tensor is firstly approached by an analytic Polyakov approximation. This already reveals a crucial difference with respect to classical stellar equilibrium: We find families of solutions that exhibit bounded pressures and mass up to a central core of Planckian radius. A minimal deformation of the Polyakov approximation inside this central core is sufficient to produce regular ultracompact configurations that surpass the Buchdahl compactness bound. We review the main features of these semiclassical relativistic stars.