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New alternatives of compact stars and related gravitational-wave signatures

Due to the nonperturbative QCD dynamics in the density regime of neutron stars, new alternatives of strong matter and related stellar
structure are possible. Recently, we proposed that up-down quark stars, inverted hybrid stars, hybrid strangeon stars can possibly exist, based on the hypothesis that either quark matter or strangeon matter is the ground state of bulk strong matter. They can meet various astrophysical constraints on masses-radii and tidal deformabilities, some with distinct gravitational-wave signatures that may help their discriminations in future observations.

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