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Orbital Properties and Gravitational Waves Signatures of Strange Crystal Planets

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In this work we consider the possibility that strange quark matter may be manifested in the form of strange crystal planets. These planet-like objects are made up of nuggets of strange quark matter (SQM), organized in a crystalline structure. We consider the so–called strange matter hypothesis proposed by Bodmer, Witten and Terazawa, in that, strange quark matter may be the absolutely stable state of matter. {\bf In this context, we analyze planets made up} entirely of strangelets arranged in a crystal lattice. Furthermore we propose that a solar system with a host compact star may be orbited by strange crystal planets. Under this assumption we calculate the relevant quantities that could potentially be observable, such as the planetary tidal disruption radius, and the gravitational waves signals that may arise from potential star-planet merger events. Our results show that strange crystal planets could potentially be used as an indicator for the the existence of SQM.

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