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Gravitational wave emission from merging strange quark star - strange planet.

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Strange-quark matter (SQM) may be the true ground state of hadronic matter, indicating that the observed pulsars may actually be strange stars (SSs), but not neutron stars. According to the SQM hypothesis, the existence of a hydrostatically stable sequence of SQM stars has been predicted, ranging from 1 to 2 solar mass SSs, to smaller strange dwarfs and even strange planets. While gravitational wave (GW) astronomy is expected to open a new window to the universe, it will shed light on the search for SQM stars. Here we show that due to their extreme compactness, strange planets can spiral very close to their host SSs without being tidally disrupted. Like inspiraling neutron stars or black holes, these systems would serve as new sources of GW bursts, producing strong GWs at the final stage. The events occurring in our local universe can be detected by upcoming GW detectors, such as Advanced LIGO and the Einstein Telescope. This effect provides a unique probe to SQM objects and is hopefully a powerful tool for testing the SQM hypothesis.

Collaboration you are representing

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