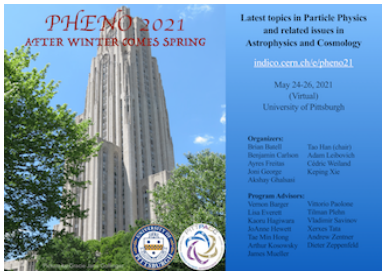

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Axions and scalars in neutron star mergers

Monday 24 May 2021 18:00 (15 minutes)

While supernovae and cooling neutron stars have long been fruitful environments for constraining dark sector particles such as axions, neutron star mergers offer a novel territory to explore BSM physics and look for its signatures in the electromagnetic and gravitational wave signals from the merger. Axions interact weakly with hot, dense nuclear matter and therefore will escape from the merger remnant, cooling it. We find that significant cooling can occur on the timescales relevent for neutron star mergers. Other BSM particles, within current constraints on their parameters, may be trapped inside the merger remnant, perhaps contributing significantly to thermal equilibration of the nuclear matter in the remnant. We calculate the timescale of thermal equilibration due to a trapped gas of CP-even scalar particles inside a merger remnant.

Summary

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