

Dark Matter and Stars: Multi-Messenger Probes of Dark Matter and Modified Gravity

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Mergers of Dark Matter Admixed Neutron Stars

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We investigate mergers of neutron stars consisting of two non-interacting fluids minimally coupled to the gravitational field using the numerical relativity code BAM. The first fluid represents baryonic matter, whereas the second fluid models dark matter, which we describe using the equation of state of a degenerate Fermi gas.

We consider two different scenarios for the distribution of the dark matter. In the first scenario the dark matter is confined to the core of the star, whereas in the second scenario the dark matter extends beyond the surface of the baryonic matter forming a halo around the baryonic star.

We show how the dark matter impacts the binary dynamics and merger waveforms.

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