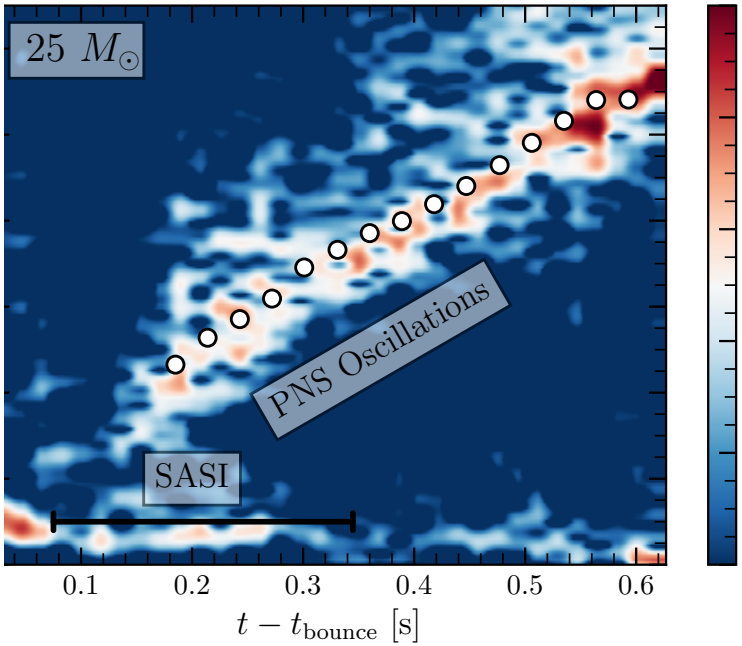
Gravitational Waves from CCSNe: 3D

Objectives

To determine what the signature of 3D supernovae is in gravitational waves and the physics of their excitation.

Impact

Our new models demonstrate that the GW signature of CCSNe has universal features that enable more efficient extraction in LIGO-like detectors.



Accomplishments

We show that the GW signal is dominated by f- and g-mode oscillations of the proto-neutron star and its frequency evolution encodes the contraction rate of the latter, which, in turn, is known to depend on the star's mass, on the equation of state, and on transport properties in warm nuclear matter. We show that the energy radiated in gravitational waves is proportional to the amount of turbulent energy accreted by the proto-neutron star.

Citation: Radice et al. 2018 (arXiv:1812:07703); Contact : Adam Burrows or David Radice