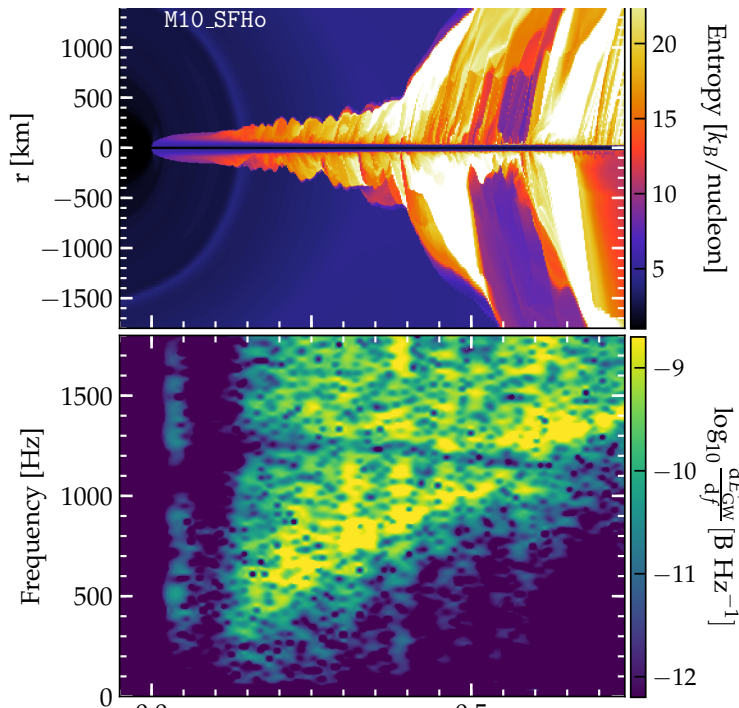# Gravitational Wave Signatures of CCSN

Objectives

Core-Collapse supernovae are strong sources of gravitational waves. We seek to determine the associated GW signatures and what can be learned.

Impact

During explosion, the inner PNS core is excited into oscillation. The GWs from these oscillations depend upon and can reveal the nuclear EOS.

Accomplishments

The Princeton group (Morozova et al. 2018) conducted a set of multi-group neutrino radiation hydrodynamic simulations of core-collapse supernovae (CCSNe). They demonstrate that starting from ~400 ms after core bounce the dominant GW signal represents the fundamental quadrupole oscillation mode (f-mode) of the proto-neutron star (PNS). They found a universal frequency-time trajectory that can be used as a prior on parameter retrieval.

Citation: Morozova et al. 2018; Contact: Vikotoriya Morozova and/or Adam Burrows