

Title: Host galaxies of merging compact objects

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Abstract:

The properties of the host galaxies of merging compact objects can provide us with fundamental information to comprehend the nature of their progenitors in the era of gravitational-wave astronomy.

I will present a method to explore the galaxies where binary compact objects form and merge, by combining galaxy catalogs from hydrodynamical cosmological simulations together with state of the art population synthesis models. This methodology has been recently shown to be successful at reproducing the cosmic merger rates computed by LIGO-Virgo.

I will show that the stellar mass of the host galaxy is an excellent tracer of the merger rate per galaxy of double neutron stars (DNS), double black holes (DBH) and black hole-neutron star binaries (BHNS). Our methodology has shown to be consistent with the DNS merger rate for Milky-Way like galaxies ($\sim 16\text{-}121 \text{ Myr}^{-1}$) and the DNS merger rate inferred from GW170817.

I will also discuss the merger rate per galaxy in terms of early and late-type galaxies. Our results suggest that most of DNSs, BHNSs, and DBHs merging in the local Universe are in early-type galaxies.