Contribution ID: **74** Type: **Presentation**

Multi-messenger observations in the Einstein Telescope era: binary neutron star and black hole - neutron star mergers

Wednesday 8 May 2024 09:30 (15 minutes)

The multi-messenger and multi-wavelength observations of the remarkable GW170817 event have significantly enhanced our comprehension of kilonova and relativistic-jet-related emissions following a binary neutron star (BNS) merger. While the outcomes of black hole-neutron star (BHNS) mergers remain less observationally constrained, leveraging insights from BNS mergers enables us to partially bridge these knowledge gaps. Consequently, we are empowered to make well-founded prognostications regarding the anticipated electromagnetic (EM) counterparts of gravitational wave (GW) transients arising from both BNS and BHNS mergers, poised for detection in the near future. In two recent studies (Colombo et al., 2022 and 2023) we constructed a synthetic cosmological populations of BNS and BHNS mergers, incorporating cutting-edge computations of associated GW and EM emissions. Utilizing these models, we have forecasted the occurrences of these phenomena during the current (O4) and forthcoming (O5) observing runs of ground-based interferometric GW detectors, namely the Advanced LIGO and Virgo. In this talk, I will offer an exploration into the extension of these predictions to the era of the Einstein Telescope, unveiling the bright future of BNS and BHNS mergers.

Primary author: COLOMBO, Alberto (Università degli Studi di Milano - Bicocca)

Session Classification: OSB

Track Classification: Observational Science Board (OSB)