ID de Contribution: **75** Type: **POPULATIONS DES SOURCES**

The massive binary black hole population across cosmic time seen under a semi-analytical perspective

jeudi 1 avril 2021 10:00 (15 minutes)

Current and future surveys are going to shed light on the formation and evolution of massive black hole binaries. While current pulsar-timing experiments will detect a gravitational wave (GW) background signal generated by the incoherent superposition of GWs from the whole population of massive binary black holes, the forthcoming LISA experiment will likely detect singular coalescences events. In this scenario, theoretical studies are vital to provide forecasts for these experiments and to help to interpret their results within a consistent cosmological picture. In this work, we contribute to these theoretical works by presenting preliminary results about binary black hole evolution by using the state-of-the-art semianalytical model L-Galaxies. The main advantage of this model is its flexibility to be run on the dark matter merger trees of the Millennium suite of simulations whose different box sizes and dark matter mass resolution offer the capability to explore different physical processes undergone by galaxies over a wide range of scales and environments. In particular, L-Galaxies includes a proper treatment for the spin and growth evolution presented in Izquierdo-Villalba et al. 2020, generating a reliable population of massive black holes at z<4. By linking this model with some physically-motivated assumptions about the pairing and hardening phase evolution of the binary systems, we can obtain predictions about how the massive binary population evolves with time, their expected merger rates and what are the exact properties of their hosting galaxies.

Auteur principal: IZQUIERDO-VILLALBA, David (Università degli studi di Milano-Bicocca)

Orateur: IZQUIERDO-VILLALBA, David (Università degli studi di Milano-Bicocca)

Classification de Session: Contributed talks: populations of sources