

## The cosmic dance

*Thursday, 15 June 2023 14:55 (15 minutes)*

Cosmological hydrodynamic simulations are unique and successful tools for investigating the evolution of galaxies in a cosmological context. The introduction of BHs and their feedback into simulations - mandatory to model the intertwined growth of BHs and host galaxies - runs up against numerical limitations that are circumvented with ad-hoc sub-resolution techniques.

However, the accurate reconstruction of BH dynamics proves to be not only a necessary ingredient to recover the AGN feedback that influences structure growth, but also a powerful tool to fully exploit the new window offered by gravitational wave astrophysics for the study of the formation and evolution of cosmic structures. To this aim, we have developed a new physically-based method to reproduce the dynamical friction force that binds BHs at the centre of galaxies and drives the early stages of mergers, and we want to present it and discuss the preliminary results.

**Primary author:** DAMIANO, Alice (Istituto Nazionale di Astrofisica (INAF))

**Presenter:** DAMIANO, Alice (Istituto Nazionale di Astrofisica (INAF))

**Session Classification:** Cosmological Simulation, Jet Pulsar Wind Nebulae (PWN), Mergers and Explosive Events, Other Simulations