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Reconstructing the history of the Milky Way in the Gaia era

At present, our understanding of the formation history of the MW is limited due to the complexity of observing the imprints of accretion events and of reproducing them in numerical simulations. Moreover, though being the only galaxy, in which the Galactic potential can be probed in detail, the distribution of mass in the MW, and hence of the dark matter, is poorly constrained, especially at large distances. In addition, the MW is not isolated, and it has recently been suggested that the infall of the LMC can induce a perturbation in the stellar and dark matter distribution of the MW. As a consequence, the details of the formation history of our Galaxy are still unknown, such as the number of accretion events, the mass of the accreted galaxies, and the epoch of these events. Yet this information is crucial to understand our environment and to constrain the theoretical models and simulations that try to reproduce it.

In this talk I will present recent works that have been conducted to better characterize our Galaxy and its history thanks to the Gaia mission.