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## The Milky Way as a cosmological laboratory

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The Milky Way is the galaxy we can dissolve in its individual constituents and thus study in most detail. The abundances of individual chemical elements in stars reflect the chemical composition of the gas at the location and time of their formation. The combined stellar record of the Galaxy can thus be used to analyze its resolved star formation history. The motions of the Galaxy's stars can be used to study the accretion history and thus allow to identify remnants of accreted and tidally dissolved dwarf galaxies. The motions also allow to weigh the various components of the Milky Way and are thus of critical importance to analyze the distribution of dark matter.

The past decade has seen several major efforts to measure chemical abundances for more than a Million stars by means of large spectroscopic surveys, complemented by information of the positions, motions and distances of stars provided by ESA's astrometry satellite Gaia, which was launched in 2013. The combined data sets thus provide us with an integrated view on the chemical and kinematical history of the Galaxy and its various stellar populations. Combined with the results of cosmological gas dynamical simulations we thus can disentangle the various physical processes that have shaped the Galaxy's structure, get a detailed view of the complex structure of the Milky Way and its convoluted formation history, and, eventually derive interesting constraints on the underlying cosmological paradigm.

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