

The Milky Way Revealed by Gaia: The Next Frontier



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Close stellar interactions from Gaia (invited talk)

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A great fraction of stars are born in binary or multiple systems. For a given stellar population, about a third would be products of binary interaction: stripped stellar companions, semi-detached systems, or stellar mergers. A particularly important phase in the life of a binary is the phase of common envelope, which is responsible for the formation of compact binary systems, such as gravitational wave sources, or supernova progenitors. During this phase, the unstable mass transfer from one star to its companion leads to the formation of a shared, non-coronating gaseous layer, called the common envelope. The quick spiral in of the companion inside this layer transfers the orbital angular momentum into the envelope, which can be fully or partially ejected. The final system will be a compact binary, or a stellar merger remnant, respectively. The high-precision astrometry, spectro-photometry, and time-domain capabilities of Gaia have allowed us to explore close stellar interactions in two different ways: on the one hand, it has allowed us to directly study the transients, called Luminous Red Novae, caused by the ejection of the common envelope; on the other hand, the DR3 catalogue has provided new ways to identify new interacting binary systems. In my talk, I will present the results of ongoing work aimed to better understand these two types of close stellar interactions.

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