## Algorithmic breakthroughs for the acceleration of LISA's data processing

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The LISA mission is a space-based interferometer designed to detect gravitational waves at frequencies on the order of millihertz. LISA will detect numerous types of sources, such as compact binary systems: EMRIs, MBHBs, and GBs.

Data processing is a major challenge for this mission, as several thousand sources will need to be analyzed simultaneously due to their overlap in both the time and frequency domains. This is especially true for Galactic Binaries (GBs), which will be the most numerous sources (several tens of thousands).

Current methods, which are based on Bayesian inference, are not efficient enough to process the data flow related to GBs, due to their large number and overlapping signals. The projects I am working on aim to accelerate data processing by using new methods based on artificial intelligence. For example, I am exploring the use of Normalizing Flow techniques to determine the physical parameters of GBs, with the goal of fully characterizing a GB in significantly less computational time compared to traditional methods.

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