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Tidal Stellar Streams: what do they say about our Universe?

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Abstract

The ΛCDM cosmological model predicts that galaxy formation occurs in a hierarchical way. This implies that a galaxy like the Milky Way (MW) has been formed by the merger of smaller galaxies and by the accretion of dwarf galaxies.

The dwarf galaxies that are accreted in this process are first destroyed and then integrated into the halo of the main galaxy. During the first stages, the tidal forces generate stellar streams of low surface brightness (LSB). The number of these stellar tidal streams and their characteristics depend on the dark matter model of our Universe, as this is responsible of how galaxy accretion occurs.

The ARRAKIHS (Analysis of Resolved Remnants of Accreted galaxies as a Key Instrument for Halo Surveys) space mission will observe, for the first time, stellar tidal streams from space down to very faint surface brightnesses (30-31 mag/arcsec^2) and will therefore allow us to study the nature of dark matter.

In this poster we show how ARRAKIHS will provide robust statistics of the number and shapes of these stellar streams (formed in the accretion of satellite galaxies), as well as the implications this will have for our knowledge of dark matter.

My poster in zenodo.org can be found here