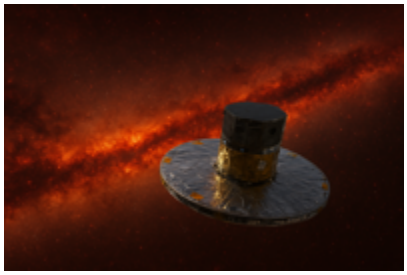

Contribution ID: **66** Type: **not specified**

Milky Way spiral arms across stellar populations

Wednesday 28 January 2026 10:17 (7 minutes)

The Milky Way's (MW) spiral structure has been longly studied using several tracers; however, it is not unambiguously determined yet. We address this by combining a hydrodynamical simulation and observational data.
In our simulation, stellar populations as old as 11Gyr and with velocity dispersions up to ~90km/s have overdensities coincident with the youngest spiral arms at all times. The global spiral pattern is transient on timescales of roughly 100Myr and shows disconnections and reconnections of arms segments. Young stars react faster to this evolution than old stars, which produces stronger arms in the first case. However, the scaling between arm strength and stellar age evolves with time depending on the strength of the global spiral structure.
In the case of the MW, we use a sample of A-type stars to demonstrate that this intermediate-age population also shows spiral substructure. Furthermore, our sample also reveals the kinematic signature of the Galactic warp.
Studying the interplay between all stellar populations is key to understanding the nature of MW's spiral structure.

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Session Classification: REG: Herramientas para Gaia DR3 y DR4 (I) Chair: Teresa Antoja