Contribution ID: **100** Type: **not specified**

Latest insights on cosmology from ESA's Gaia space astrometry mission

Thursday, 6 July 2023 09:45 (30 minutes)

The European Space Agency's Gaia satellite was launched in 2013 and continues to operate flawlessly today. It is measuring the distances and space motions of more than two billion stars with extreme accuracy. I will build on the talk that I gave to the 16th Patras Workshop in June 2021, and emphasise various applications to the study of the dynamics of our Galaxy, and in particular how this is related to our understanding of cosmological structure, and the existence of dark matter. I will explain how the latest data continue to demonstrate remarkable consistency with the predictions of structure formation in the Lambda CDM model. I will outline the status of the "plane-of-satellites" problem, the "core-cusp" problem, the continuing tension in estimates of the Hubble constant from the early and late Universe methods, observational evidence for the deceleration of our Galaxy's central bar due to its dark matter halo, and constraints on the time variation of the gravitational constant.

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Session Classification: Thursday Session 1