ID contributo: **59** Tipo: **Parallel talk**

Galactic Dark Matter from General Relativity

martedì 9 luglio 2024 14:20 (20 minuti)

If the dynamics of a disc galaxy is analysed from a general-relativistic viewpoint (GR), it turns out in general that the solution cannot be approximated by Newtonian theory, as is usually believed. Even under the simplifying assumptions of stationarity, axisymmetry and zero pressure (i.e. the velocity dispersion is neglected), non-Newtonian features can arise, which are ascribed to the essential role of the frame dragging. Such a "strong dragging" may contribute to sustain the observed galaxy rotation curves. Rotation curves constitute one of the main indirect measurement techniques for galactic mass. If taken into account, dragging can therefore lead to a re-weighting of the mass of galaxies, and hence of the galactic dark matter.
Future experiments to find dark matter could thus be improved. We also propose various techniques to empirically observe the possible presence of the strong dragging, in our Galaxy or in some distant ones.

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Classifica Sessioni: Parallel 2

Classificazione della track: Parallel session: Theory