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Unraveling local Galactic kinematics from the first Gaia data

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The first Gaia Data Release (Gaia-DR1, 14 September 2016) has set the stage for a profound revolution of galactic astronomy. The first released catalogue, named TGAS (Tycho-Gaia Astrometric Solution), contain parallaxes and proper motions with unprecedented accuracy for about two million well-behaved stars placed in the solar neighborhood. In this talk, we will first review the content of this catalogue in terms of astrometric accuracy and completeness, thus briefly describing the ongoing effort to estimate unbiased distances from parallaxes. Secondly we will discuss, as an example, the TGAS capabilities to undertake new challenges such us the derivation of the dynamical age and place of birth of the Young Local Associations (orbits back on time in realistic Galactic potential). Other recent papers unraveling the first scientific exploitation of Gaia data will be commented.

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